(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 15 May 2003 (15.05.2003)

PCT

(10) International Publication Number WO 03/040306 A2

C12N (51) International Patent Classification7:

(21) International Application Number: PCT/NZ02/00239

(22) International Filing Date:

7 November 2002 (07.11.2002)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/337,703

7 November 2001 (07.11.2001)

- (71) Applicants (for all designated States except US): GENE-SIS RESEARCH AND DEVELOPMENT CORPORA-TION LIMITED [NZ/NZ]; 1 Fox Street, Parnell, Auckland (NZ). WRIGHTSON SEEDS LIMITED [NZ/NZ]; 14 Hartham Place, P.O. Box 50240, Porirua (NZ).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): DEMMER, Jeroen [NL/NZ]; 59 Merriefield Avenue, Forrest Hill, Auckland (NZ). FORSTER, Richard, L. [NZ/NZ]; 36 Windermere Crescent, Blockhouse Bay, Auckland (NZ). GIBSON, John, Bryan [AU/AU]; 28 Rodway Street, Yarralumla, Canberra, ACT 2600 (AU). SHENK, Michael, Andrew [US/NZ]; 39 Cape Horn Road, Waikowhai, Auckland (NZ). NORRISS, Michael, Geoffrey [NZ/NZ]; 16 Ilam Road, Riccarton, Christchurch (NZ). GLENN, Matthew [GB/NZ]: 14 Waimarie Road, Whenuapai, Auckland (NZ). SAULSBURY, Keith, Martin [NZ/NZ]; 8 Samuel Street,

Christchurch (NZ). HALL, Claire [GB/NZ]; 2/56 Rukutai Street, Orakei, Auckland (NZ).

- (74) Agent: BALDWIN SHELSTON WATERS; P.O. Box 852, Wellington (NZ).
- (81) Designated States (national): AE, AG, AL, AM, AT (utility model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (utility model), DE, DK (utility model), DK, DM, DZ, EC, EE (utility model), EE, ES, FI (utility model), FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK (utility model), SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COMPOSITIONS FROM THE GRASSES LOLIUM PERENNE AND FESTUCA ARUNDINACEA

Compositions from the grasses Lolium perenne and Festuca arundinacea.

COMPOSITIONS ISOLATED FROM FORAGE GRASSES AND METHODS FOR THEIR USE

Reference to Related Applications

This application claims priority to U.S. Provisional Patent Application No. 60/337,703 filed November 7, 2001.

10

15

5

Technical Field of the Invention

This invention relates to polynucleotides isolated from forage grass tissues, specifically from *Lolium perenne* (perennial ryegrass) and *Festuca arundinacea* (tall fescue), as well as oligonucleotide probes and primers, genetic constructs comprising the polynucleotides, biological materials (including host cells and plants) incorporating the polynucleotides, polypeptides encoded by the polynucleotides, and methods for using the polynucleotides and polypeptides. More particularly, the invention relates to polypeptides involved in the lignin, tannin and fructan biosynthetic pathways, and to polynucleotides encoding such polypeptides.

20

25

30

Background of the Invention

Over the past 50 years, there have been substantial improvements in the genetic production potential of ruminant animals (sheep, cattle and deer). Levels of meat, milk or fiber production that equal an animal's genetic potential may be attained within controlled feeding systems, where animals are fully fed with energy dense, conserved forages and grains. However, the majority of temperate farming systems worldwide rely on the *in situ* grazing of pastures. Nutritional constraints associated with temperate pastures can prevent the full expression of an animal's genetic potential. This is illustrated by a comparison between milk production by North American grain-fed dairy cows and New Zealand pasture-fed cattle. North American dairy cattle produce, on average, twice the milk volume of New Zealand cattle, yet the genetic base is similar within both systems (New Zealand Dairy Board and United States Department of Agriculture figures). Significant potential therefore exists

to improve the efficiency of conversion of pasture nutrients to animal products through the correction of nutritional constraints associated with pastures.

Lignin Biosynthetic Pathway

5

10

15

20

25

30

Lignin is an insoluble polymer that serves as a matrix around the polysaccharide components of some plant cell walls, and that is primarily responsible for the rigidity of plant stems. Generally, the higher the lignin content, the more rigid the plant. For example, tree species synthesize large quantities of lignin, with lignin constituting 20%-30% of the dry weight of wood. The lignin content of grasses ranges from 2-8% of dry weight and changes during the growing season. In addition to providing rigidity, lignin aids in water transport within plants by rendering cell walls hydrophobic and water impermeable. Lignin also plays a role in disease resistance of plants by impeding the penetration and propagation of pathogenic agents.

Forage digestibility is affected by both lignin composition and concentration. Lignin is largely responsible for the digestibility, or lack thereof, of forage crops, with small increases in plant lignin content resulting in relatively high decreases (> 10%) in digestibility (Buxton and Russell, *Crop. Sci.* 28:5358-558, 1988). For example, crops with reduced lignin content provide more efficient forage for cattle, with the yield of milk and meat being higher relative to the amount of forage crop consumed. During normal plant growth, an increase in the maturity of the plant stem is accompanied by a corresponding increase in lignin content and composition that causes a decrease in digestibility. This change in lignin composition is to one of increasing syringyl:guaiacyl (S:G) ratio. When deciding on the optimum time to harvest forage crops, farmers must therefore choose between a high yield of less digestible material and a lower yield of more digestible material.

Lignin is formed by polymerization of three different monolignols, *para*-coumaryl alcohol, coniferyl alcohol and sinapyl alcohol, that are synthesized in a multistep pathway, with each step in the pathway being catalyzed by a different enzyme. The three monolignols are derived from phenylalanine or tyrosine in a multistep process and are then polymerized into lignin by a free radical mechanism. Following polymerization, *para*-coumaryl alcohol, coniferyl alcohol and sinapyl alcohol are converted into the *p*-hydroxyphenyl (H), guaiacyl (G) and syringyl (S) units of lignin, respectively. While these three types of lignin subunits

are well known, it is likely that slightly different variants of these subunits may be involved in the lignin biosynthetic pathway in various plants. For example, studies suggest that both free monolignols and monolignol-4-coumarate esters may be substrates for lignin formation in grasses. The relative concentration of the monolignol residues in lignin varies among different plant species and within species. For example, the monolignol content for H/G/S of grasses, alfalfa and softwood gymnosperms is 22%/44%/34%, 7%/39%/54% and 14%/80%/6%, respectively (van Soest in "Nutritional Ecology of the Ruminant". Cornell University Press, Ithaca, NY). The composition of lignin may also vary among different tissues within a specific plant.

10

15

20

25

30

Coniferyl alcohol, para-coumaryl alcohol and sinapyl alcohol are synthesized by similar pathways (Whetten et al., Annu. Rev. Plant Physiol. Plant Mol. Biol. 49:585-609, 1998; Guo et al., Plant Cell 13:73-88, 2001). The first step in the lignin biosynthetic pathway is the deamination of phenylalanine or tyrosine by phenylalanine ammonia-lyase (PAL) or tyrosine ammonia-lyase (TAL), respectively. In maize, the PAL enzyme also has TAL activity (Rosler et al., Plant Physiol. 113:175-179, 1997). The product of TAL activity on tyrosine is 4-coumarate, whereas the product of PAL activity on phenylalanine is cinnamate which is then hydroxylated by cinnamate 4-hydroxylase (C4H) to form 4-4-Coumarate is hydroxylated by coumarate 3-hydroxylase (C3H) to give coumarate. caffeate. The newly added hydroxyl group is then methylated by caffeic acid O-methyl transferase (COMT) to give ferulate. Several other methylation reactions can be catalyzed by COMT, including caffeoylaldehyde to coniferaldehyde, and 5-hydroxyconiferaldehyde to sinapaldehyde. 4-Coumarate, caffeate and ferulate can all be conjugated to coenzyme A by 4-coumarate: CoA ligase (4CL) to form 4-coumaryl CoA, caffeoyl CoA and feruloyl CoA, respectively. Caffeoyl CoA can then be methylated by the enzyme caffeoyl-CoA O-methyl transferase (CAMT).

Coniferaldehyde is hydroxylated to 5-hydroxyconiferaldehyde by ferulate 5-hydroxylase (F5H). Reduction of 4-coumaryl CoA, caffeoyl CoA and feruloyl-CoA to 4-coumaraldehyde, caffeoyl aldehyde and coniferaldehyde, respectively, is catalyzed by cinnamoyl-CoA reductase (CCR). Coumaraldehyde, caffeoyl aldehyde, coniferaldehyde and 5-hydroxyconfieraldehyde are further reduced by the action of cinnamyl alcohol dehydrogenase (CAD) to give coniferyl alcohol which is then converted into its glucosylated

form for export from the cytoplasm to the cell wall by coniferol glucosyl transferase (CGT). Recently a sinapyl alcohol dehydrogenase (SAD) was described that converts sinapaldehyde to sinapyl alcohol (Li et al., Plant Cell 13:1567-1586, 2001). Following export, the deglucosylated form of coniferyl alcohol is obtained by the action of coniferin beta-glucosidase (CBG). Finally, polymerization of the three monolignols to provide lignin is catalyzed by phenolase (PNL), laccase (LAC) and peroxidase (PER). For a more detailed review of the lignin biosynthetic pathway, see Whetton R and Sederoff R, The Plant Cell, 7:1001-1013, 1995 and Whetten et al., Annu. Rev. Plant Physiol. Plant Mol. Biol. 49:585-609, 1998.

5

10

15

20

25

30

Both lignin levels and composition have been changed in a range of plant species by altering the expression of specific lignin biosynthetic enzymes. For example, anti-sense 4CL constructs in transgenic aspen trees reduced lignin content from 20 to 11% (a 45% reduction) but at the same time increased both cellulose levels (by 15%) and growth rate (Hu et al. Nature Biotechnol. 17:808-812, 1999). These trees had the same level of total carbon, suggesting that carbon partitioning had been altered. Reducing 4CL by either anti-sense or sense-suppression in tobacco plants led to an accumulation of hydroxycinnamic acids in cell walls as well as a reduction in both guaiacyl and syringyl lignin units (Kajita et al., Plant Cell. Physiol. 37:957-965, 1996). In transgenic tobacco plants in which levels of C4H were reduced by anti-sense or sense suppression, total lignin content was reduced, in addition to a reduction in syringyl lignin units (Sewalt et al., Plant Physiol. 115:41-50, 1997). Reducing the levels of PAL in tobacco plants by anti-sense or sense-suppression reduced total lignin content but did not change the syringyl-guaiacyl (S:G) lignin ration. In alfalfa, reducing expression of COMT through either anti-sense or gene silencing decreased total lignin by decreasing the amount of guaiacyl units and resulted in a near total loss of syringyl lignin units (Guo et al., Plant Cell 13:73-88, 2001). In contrast, reducing CCOMT expression through anti-sense or gene silencing in alfalfa plants also decreased total lignin by reducing the total amount of guaiacyl lignin units but had no effect on the amount of syringyl lignin. Reducing CCR expression by anti-sense in tobacco plants resulted in reduced lignin content and increased S:G ratios due to lower guaiacyl lignin units (Piquemal et al., Plant J. 13:71-83, 1998). A. thaliana plants where the F5H gene had been mutated contained only traces of syringyl lignin (Marita et al., Proc. Natl. Acad. Sci. USA 96:12323-12332, 1999).

Alteration of grass lignin composition may usefully be employed to maintain high forage digestibility throughout the year. This is most important when the plant is approaching flowering and/or during flowering. At this time, the entire lignin biosynthetic pathway will preferably be reduced, in particular lowering the amount of syringyl lignin units, thereby lowering the S:G ratio and maintaining the digestibility of the forage crop.

Several of the enzymes involved in the lignin biosynthetic pathway also have other functions within the plant. For example, PAL is a key enzyme of plant and fungi phenylpropanoid metabolism and catalyzes the first step in phenylpropanoid metabolism. It is involved in the biosynthesis of a wide variety of secondary metabolites such as flavonoids, furanocoumar in phytoalexins and cell wall components. These compounds have many important roles in plants during normal growth and in responses to environmental stress. PAL catalyzes the removal of an ammonia group from phenylalanine to form transcinnamate. PAL and the related histidine ammonia lyase are unique enzymes which are known to have the modified amino acid dehydroalanine (DHA) in their active site (Taylor et al., J. Biol. Chem. 265:18192-18199, 1990). Phenylalanine and histidine ammonia-lyases (PAL) active site has a consensus of GTITASGDLVPLSYIA. The serine residue is central to the active site, and the region around this active site residue is well conserved (Langer et al., Biochem. 33:6462-6467, 1994).

10

15

20

25

30

C4H, which is a member of the cytochrome P450 monooxygenase superfamily, plays a central role in both phenylpropanoid metabolism and lignin biosynthesis where it anchors a phenylpropanoid enzyme complex to the endoplasmic reticulum (ER). The phenylpropanoid pathway controls the synthesis of lignin, flower pigments, signaling molecules, and a large spectrum of compounds involved in plant defense against pathogens and UV light. This is also a branch point between general phenylpropanoid metabolism and pathways leading to various specific end products. 4CLs are a group of enzymes necessary for maintaining a continuous metabolic flux for the biosynthesis of plant phenylpropanoids, such as lignin and flavonoids that are essential to the survival of plants, because they serve important functions in plant growth and adaptation to environmental perturbations. Three isoforms of 4CL have been identified with distinct substrate preference and specificities. Expression studies in angiosperms revealed a differential behavior of the three genes in various plant organs and upon external stimuli such as wounding and UV irradiation or upon challenge with fungi.

One isoform is likely to participate in the biosynthetic pathway leading to flavonoids whereas the other two are probably involved in lignin formation and in the production of additional phenolic compounds other than flavonoids (Ehlting *et al.*, *Plant J.* 19:9-20, 1999).

F5H is involved in the phenylpropanoid biosynthesis pathway. It belongs to the CYP84 subfamily of the cytochrome P450 family and is known as cytochrome P450 84A1. F5H is one of the enzymes in the pathways leading to the synthesis of sinapic acid esters, but also has coniferaldehyde hydroxylase activity (Nair et al., Plant Physiol. 123:1623-1634, 2000). In the generalized pathway for phenylpropanoid metabolism, F5H catalyzes the formation of 5-hydoxyferulate (a precursor of sinapate) and sinapate in turn as the precursor for sinapine and for sinapoyl CoA in two bifurcated pathways (Chapple et al., Plant Cell 4:1413-1424, 1992). Sinapoyl CoA has been considered as the precursor for sinapyl alcohol, which is then polymerized into syringyl (S) lignin. In addition, CYP84 F5H product carries out the hydroxylation of coniferaldehyde (ConAld) to 5-OH ConAld (Nair et al., Plant Physiol. 123:1623-1634, 2000).

Peroxidases are heme-containing enzymes that use hydrogen peroxide as the electron acceptor to catalyze a number of oxidative reactions. They belong to a superfamily consisting of 3 major classes. Class III consists of the secretory plant peroxidases, which have multiple tissue-specific functions in removal of hydrogen peroxide from chloroplasts and cytosol, oxidation of toxic compounds, biosynthesis of the cell wall, defense responses towards wounding, indole-3-acetic acid (IAA) catabolism and ethylene biosynthesis.

Fructan Biosynthetic Pathway

5

10

15

20

25

30

Plant carbohydrates can be divided into two groups depending on their function within the plant. Structural carbohydrates, such as cellulose, are usually part of the extracellular matrix. Non-structural, storage carbohydrates act as either long- or short-term carbohydrate stores. Examples of non-structural carbohydrates include starch, sucrose and fructans.

Fructans are polymers that are stored in the vacuole and that consist of linear and branched chains of fructose units (for review see Vijn and Smeekens *Plant Physiol.* 120:351-359, 1999). They play an important role in assimilate partitioning and possibly in stress tolerance in many plant families. Grasses use fructans instead of starch as a water-soluble

carbohydrate store (Pollock et al., in "Regulation of primary metabolic pathways in plants", N.J. Kruger et al., (eds), Kluwer Academic Publishers, The Netherlands, pp195-226, 1999). Increasing the amount of fructans and sucrose in forage crops leads to an increase in the level of water-soluble carbohydrates and thereby enhances the nutritional value of the plants. In addition, increasing the amount of fructans in forage plants decreases methane production in animals fed the plants, thereby leading to lower greenhouse gas emissions, and decreases urea production in animals as less protein is degraded in the rumen (Biggs and Hancock, Trends in Plant Sci. 6:8-9, 2001). Fructans have also been implicated in protecting plants against water deficits caused by drought or low temperatures. Introduction of enzymes involved in the fructan biosynthetic pathway into plants that do not naturally synthesize fructans may be employed to confer cold tolerance and drought tolerance (Pilon-Smits, Plant Physiol. 107:125-130, 1995).

5

10

15

20

25

30

The number of fructose units within a fructan chain is referred to as the degree of polymerization (DP). In grasses, fructans of DP 6-10 are common. Such fructans of low DP are naturally sweet and are therefore of interest for use as sweeteners in foodstuffs. Long fructan chains form emulsions with a fat-like texture and a neutral taste. The human digestive system is unable to degrade fructans, and fructans of high DP may therefore be used as low-calorie food ingredients. Over-expression of enzymes involved in the fructan biosynthetic pathway may be usefully employed to produce quantities of fructans that can be purified for human consumption.

Five major classes of structurally different fructans have been identified in plants, with each class showing a different linkage of the fructosyl residues. Fructans found in grasses are of the mixed levan class, consisting of both (2-1)- and (2-6)-linked beta-D-fructosyl units (Pollock *et al.*, in "Regulation of primary metabolic pathways in plants", N.J. Kruger *et al.*, (eds), Kluwer Academic Publishers, The Netherlands, pp195-226, 1999). Fructans are synthesized by the action of fructosyltransferase enzymes on sucrose in the vacuole. These enzymes are closely related to invertases, enzymes that normally hydrolyze sucrose.

Grasses use two fructosyltransferase enzymes to synthesize fructans, namely sucrose:sucrose 1-fructosyltransferase (1-SST) and sucrose:fructan 6-fructosyltransferase (6-SFT) (Pollock *et al.*, in "Regulation of primary metabolic pathways in plants", N.J. Kruger *et*

al., (eds), Kluwer Academic Publishers, The Netherlands, pp195-226, 1999). 1-SST is a key enzyme in plant fructan biosynthesis, while 6-SFT catalyzes the formation and extension of beta-2,6-linked fructans that is typically found in grasses. Specifically, 1-SST catalyzes the formation of 1-kestose plus glucose from sucrose, while 6-SFT catalyzes the formation of bifurcose plus glucose from sucrose plus 1-kestose and also the formation of 6-kestose plus glucose from sucrose. Both enzymes can modify 1-kestose, 6-kestose and bifurcose further by adding additional fructose molecules. Over-expression of both 1-SST and 6-SFT in the same plant may be employed to produce fructans for use in human foodstuffs (Sevenier et al., Nature Biotechnol. 16:843-846; Hellwege et al., Proc. Nat. Acad. Sci. USA 97:8699-8704, 2000).

5

10

15

20

25

30

The synthesis of sucrose from photosynthetic assimilates in plants, and therefore the availability of sucrose for use in fructan formation, is controlled, in part, by the enzymes sucrose phosphate synthase (SPS) and sucrose phosphate phosphatase (SPP). Sucrose plays an important role in plant growth and development, and is a major end product of photosynthesis. It also functions as a primary transport sugar and in some cases as a direct or indirect regulator of gene expression (for a review see Smeekens, Curr. Opin. Plant Biol. 1:230-234, 1998). SPS regulates the synthesis of sucrose by regulating carbon partitioning in the leaves of plants and therefore plays a major role as a limiting factor in the export of photoassimilates out of the leaf. The activity of SPS is regulated by phosphorylation and moderated by concentration of metabolites and light (Huber et al., Plant Physiol. 95:291-297, 1991). Specifically, SPS catalyzes the transfer of glucose from UDP-glucose to fructose-6-Suc-6-P is then thereby forming sucrose-6-phosphate (Suc-6-P). dephosphorylated by SPP to form sucrose (Lunn et al., Proc. Natl. Acad. Sci. USA 97:12914-12919, 2000). The enzymes SPS and SPP exist as a heterotetramer in the cytoplasm of mesophyll cells in leaves, with SPP functioning to regulate SPS activity. SPS is also important in ripening fruits, sprouting tubers and germinating seeds (Laporte et al., Planta 212:817-822, 2001).

Once in the vacuole, sucrose can be converted into fructan by fructosyltransferases as discussed above, or hydrolyzed into glucose and fructose by the hydrolase enzymes known as invertases (Sturm, *Plant Physiol.* 121:1-7, 1999). There are several different types of invertases, namely extracellular (cell wall), vacuolar (soluble acid) and cytoplasmic, with at

least two isoforms of each type of invertase normally being found within a plant species. In addition to having different subcellular locations, the different types of invertases have different biochemical properties. For example, soluble and cell wall invertases operate at acidic pH, whereas cytoplasmic invertases work at a more neutral or alkaline pH. Invertases are believed to regulate the entry of sucrose into different utilization pathways (Grof and Campbell, *Aust. J. Plant Physiol.* 28:1-12, 2001). Reduced invertase activity may increase the level of water-soluble carbohydrates in plants. Plants contain several isoforms of cell wall invertases (CWINV), which accumulate as soluble proteins. CWINV plays an important role in phloem unloading and in stress response. It hydrolyzes terminal non-reducing beta-D-fructofuranoside residues in beta-D-fructo-furanosides.

Another enzyme that acts upon sucrose in plants is soluble sucrose synthase (SUS). Recent results indicate that SUS is localized in the cytosol, associated with the plasma membrane and the actin cytoskeleton. Phosphorylation of SUS is one of the factors controlling localization of the enzyme (Winter and Huber, *Crit. Rev. Biochem. Mol. Biol.* 35:253-89, 2000). It catalyzes the transfer of glucose from sucrose to UDP, yielding UDP-glucose and fructose. Increasing the amount of SUS in a plant increases the amount of cellulose synthesis, whereas decreasing SUS activity should increase fructan levels. Increased SUS concentration may also increase the yield of fruiting bodies. SUS activity is highest in carbon sink tissues in plants and low in photosynthetic source tissues, and studies have indicated that SUS is the main sucrose-cleaving activity in sink tissues. Grasses have two isoforms of SUS that are encoded by separate genes. These genes are differentially expressed in different tissues.

Tannin Biosynthetic Pathway

5

10

15

20

25

30

Condensed tannins are polymerized flavonoids. More specifically, tannins are composed of catechin 4-ol and catechin monomer units, and are stored in the vacuole. In many temperate forage crops, such as ryegrass and fescue, foliar tissues are tannin-negative. This leads to a high initial rate of fermentation when these crops are consumed by ruminant livestock, resulting in both protein degradation and production of ammonia by the livestock. These effects can be reduced by the presence of low to moderate levels of tannin. In certain other plant species, the presence of high levels of tannins reduces palatability and nutritive

value. Introduction of genes encoding enzymes involved in the biosynthesis of condensed tannins into a plant may be employed to synthesize flavonoid compounds that are not normally made in the plant. These compounds may then be isolated and used for treating human or animal disorders or as food additives.

Much of the biosynthetic pathway for condensed tannins is shared with that for anthocyanins, which are pigments responsible for flower color. Therefore, modulation of the levels of enzymes involved in the tannin biosynthetic pathway may be employed to alter the color of foliage and the pigments produced in flowers.

5

10

15

20

25

30

Most tannins described to date contain pro-cyanidin units derived from dihydroquercetin and pro-delphinidin units derived from dihydromyricetin. However, some tannins contain pro-pelargonidin units derived from dihydrokaempferol. The initial step in the tannin biosynthetic pathway is the condensation of coumaryl CoA with malonyl CoA to give naringenin-chalcone, which is catalyzed by the enzyme chalcone synthase (CHS). The enzyme chalcone isomerase (CHI) catalyzes the isomerization of naringenin chalcone to naringenin (also known as flavanone), which is then hydroxylated by the action of the enzyme flavonone 3- beta-hydroxylase (F3 β H) to give dihydrokaempferol. The enzyme flavonoid 3'-hydroxylase (F3'OH) catalyzes the conversion of dihydrokaempferol to dihydroquercetin, which in turn can be converted into dihydromyricetin by the action of flavonoid 3'5'-hydroxylase (F3'5'OH). The enzyme dihydroflavonol-4-reductase (DFR) catalyzes the last step before dihydrokaempferol, dihydroquercetin and dihydromyricetin are committed for either anthocyanin (flower pigment) or proanthocyanidin (condensed tannin) formation. DFR also converts dihydrokaempferol to afzelchin-4-ol, dihydroquercetin to catechin-4-ol, and dihydromyricetin to gallocatechin-4-ol, probably by the action of more than one isoform. For a review of the tannin biosynthetic pathway, see, Robbins M.P. and Morris P. in Metabolic Engineering of Plant Secondary Metabolism, Verpoorte and Alfermann (eds), Kluwer Academic Publishers, the Netherlands, 2000.

While polynucleotides encoding some of the enzymes involved in the lignin, fructan and tannin biosynthetic pathways have been isolated for certain species of plants, genes encoding many of the enzymes in a wide range of plant species have not yet been identified.

Thus there remains a need in the art for materials useful in the modification of lignin, fructan and tannin content and composition in plants, and for methods for their use.

Summary of the Invention

5

10

15

20

25

30

The present invention provides enzymes involved in the lignin, fructan or tannin biosynthetic pathways that are encoded by polynucleotides isolated from forage grass tissues. The polynucleotides were isolated from *Lolium perenne* (perennial ryegrass) and *Festuca arundinacea* (tall fescue) tissues taken at different times of the year, specifically in winter and spring, and from different parts of the plants, including: leaf blades, leaf base, pseudostems, floral stems, roots, inflorescences and stems. The present invention also provides genetic constructs, expression vectors and host cells comprising the inventive polynucleotides, and methods for using the inventive polynucleotides and genetic constructs to modulate the biosynthesis of lignins, fructans and tannins.

In specific embodiments, the isolated polynucleotides of the present invention comprise a sequence selected from the group consisting of: (a) SEQ ID NO: 1-62 and 125-162; (b) complements of SEQ ID NO: 1-62 and 125-162; (c) reverse complements of SEQ ID NO: 1-62 and 125-162; (d) reverse sequences of SEQ ID NO: 1-62 and 125-162; (e) sequences having a 99% probability of being functionally or evolutionarily related to a sequence of (a)-(d), determined as described below; and (f) sequences having at least 75%, 80%, 90% or 98% identity to a sequence of (a)-(d), the percentage identity being determined as described below. Polynucleotides comprising at least a specified number of contiguous residues ("x-mers") of any of SEQ ID NO: 1-62 and 125-162; and oligonucleotide probes and primers corresponding to SEQ ID NO: 1-62 and 125-162 are also provided. All of the above polynucleotides are referred to herein as "polynucleotides of the present invention."

In further aspects, the present invention provides isolated polypeptides comprising an amino acid sequence of SEQ ID NO: 63-124 and 163-190, together with polypeptides comprising a sequence having at least 75%, 80%, 90% or 98% identity to a sequence of SEQ ID NO: 63-124 and 163-190, wherein the polypeptide possesses the same functional activity as the polypeptide comprising a sequence of SEQ ID NO: 63-124 and 163-190. The present invention also contemplates isolated polypeptides comprising at least a functional portion of a polypeptide comprising an amino acid sequence selected from the group consisting of: (a)

SEQ ID NO: 63-124 and 163-190; and (b) sequences having at least 75%, 80%, 90% or 98% identity to a sequence of SEQ ID NO: 63-124 and 163-190.

In another aspect, the present invention provides genetic constructs comprising a polynucleotide of the present invention, either alone, in combination with one or more of the inventive sequences, or in combination with one or more known polynucleotides.

5

10

15

20

25

30

In certain embodiments, the present invention provides genetic constructs comprising, in the 5'-3' direction: a gene promoter sequence; an open reading frame coding for at least a functional portion of a polypeptide of the present invention; and a gene termination sequence. An open reading frame may be orientated in either a sense or anti-sense direction. Genetic constructs comprising a non-coding region of a polynucleotide of the present invention or a polynucleotide sequence complementary to a non-coding region, together with a gene promoter sequence and a gene termination sequence, are also provided. Preferably, the gene promoter and termination sequences are functional in a host cell, such as a plant cell. Most preferably, the gene promoter and termination sequences are those of the original enzyme genes but others generally used in the art, such as the Cauliflower Mosaic Virus (CMV) promoter, with or without enhancers, such as the Kozak sequence or Omega enhancer, and Agrobacterium tumefaciens nopalin synthase terminator may be usefully employed in the present invention. Tissue-specific promoters may be employed in order to target expression to one or more desired tissues. The construct may further include a marker for the identification of transformed cells.

In a further aspect, transgenic cells, such as transgenic plant cells, comprising the constructs of the present invention are provided, together with tissues and plants comprising such transgenic cells, and fruits, seeds and other products, derivatives, or progeny of such plants.

In yet another aspect, methods for modulating the lignin, fructan or tannin content and composition of a target organism, such as a plant, are provided, such methods including stably incorporating into the genome of the target plant a genetic construct comprising a polynucleotide of the present invention. In a preferred embodiment, the target plant is a forage grass, preferably selected from the group consisting of *Lolium* and *Festuca* species, and most preferably from the group consisting of *Lolium perenne* and *Festuca arundinacea*. In a related aspect, a method for producing a plant having altered lignin, fructan or tannin

composition is provided, the method comprising transforming a plant cell with a genetic construct comprising of the present invention to provide a transgenic cell, and cultivating the transgenic cell under conditions conducive to regeneration and mature plant growth.

In yet a further aspect, the present invention provides methods for modifying the activity of an enzyme in a target organism, such as a plant, comprising stably incorporating into the genome of the target organism a genetic construct of the present invention. In a preferred embodiment, the target plant is a forage grass, preferably selected from the group consisting of *Lolium* and *Festuca* species, and most preferably from the group consisting of *Lolium perenne* and *Festuca arundinacea*.

10

15

20

25

30

5

Brief Description of the Drawings

Fig. 1 shows the activity of recombinant LpSPP (SEQ ID NO: 8) and FaSPP (SEQ ID NO 7) on dephosphorylating Suc-6-P and Fru-6-P. The pET41a extract was the vector control.

Fig. 2 shows the peroxidase activity of PER3 (SEQ ID NO: 50) and PER5 (SEQ ID NO: 52) as determined by oxidation of ABTS. Horseradish peroxidase of known activity (Sigma, St Louis, MI) was used as a positive control and boiled samples as a negative control.

Fig. 3 shows PCR verification of transgenic *N. benthamiana* plants transformed with Lp6-SFT1 (SEQ ID NO: 3). Genomic DNA was isolated from kanamycin resistant T2 *N. benthamiana* plants and the Lp6-SFT fragment was amplified using specific PCR primers.

Fig. 4 shows PCR verification of transgenic *N. benthamiana* plants transformed with Lp1-SST (SEQ ID NO: 1). Genomic DNA was isolated from kanamycin resistant T2 *N. benthamiana* plants and the Lp1-SST fragment was amplified using specific PCR primers. Plant number 5 is a non-transgenic control.

Fig. 5 shows the fructan level in transgenic *N. benthamiana* lines transformed with Lp6-SFT1 (SEQ ID NO: 3) and Lp1-SST (SEQ ID NO: 1).

Fig. 6 shows the sucrose synthesizing activity of FaSPS-N (SEQ ID NO: 9) with and without SPP (SEQ ID NO: 8) in mammalian cell extracts. The non-transfected cells are controls.

Fig. 7 shows the sucrose cleaving activity of FaSUS1 (SEQ ID NO: 13) in mammalian cell extracts.

Fig. 8 shows the invertase activity for vacuolar invertase (SEQ ID NO: 25) and two cell wall invertases (SEQ ID NO: 17 and 19); absence of invertase activity from an empty vector (pPICZalphaA) control is also shown.

Detailed Description of the Invention

5

10

15

20

25

. 30

The polypeptides of the present invention, and the polynucleotides encoding the polypeptides, have activity in lignin, fructan and tannin biosynthetic pathways in plants. Using the methods and materials of the present invention, the lignin, fructan and/or tannin content of a plant may be modulated by modulating expression of polynucleotides of the present invention, or by modifying the polynucleotides or polypeptides encoded by polynucleotides. The isolated polynucleotides and polypeptides of the present invention may thus be usefully employed in the correction of nutritional imbalances associated with temperate pastures and to increase the yield of animal products from pastures.

The lignin, fructan and/or tannin content of a target organism, such as a plant, may be modified, for example, by incorporating additional copies of genes encoding enzymes involved in the lignin, fructan or tannin biosynthetic pathways into the genome of the target plant. Similarly, a modified lignin, fructan and/or tannin content can be obtained by transforming the target plant with anti-sense copies of such genes. In addition, the number of copies of genes encoding for different enzymes in the lignin, fructan and tannin biosynthetic pathways can be manipulated to modify the relative amount of each monomer unit synthesized, thereby leading to the formation of lignins, fructans or tannins having altered composition.

The present invention thus provides methods for modulating the polynucleotide and/or polypeptide content and composition of an organism, such methods involving stably incorporating into the genome of the organism a genetic construct comprising one or more polynucleotides of the present invention. In one embodiment, the target organism is a plant species, preferably a forage plant, more preferably a grass of the *Lolium* or *Festuca* species, and most preferably *Lolium perenne* or *Festuca arundinacea*. In related aspects, methods for producing a plant having an altered genotype or phenotype is provided, such methods

comprising transforming a plant cell with a genetic construct of the present invention to provide a transgenic cell, and cultivating the transgenic cell under conditions conducive to regeneration and mature plant growth. Plants having an altered genotype or phenotype as a consequence of modulation of the level or content of a polynucleotide or polypeptide of the present invention compared to a wild-type organism, as well as components (seeds, etc.) of such plants, and the progeny of such plants, are contemplated by and encompassed within the present invention.

5

10

15

20

25

The isolated polynucleotides of the present invention have utility in genome mapping, in physical mapping, and in positional cloning of genes. Additionally, the polynucleotide sequences identified as SEQ ID NOS: 1-62 and 125-162 and their variants, may be used to design oligonucleotide probes and primers. Oligonucleotide probes and primers have sequences that are substantially complementary to the polynucleotide of interest over a Oligonucleotide probes designed using the certain portion of the polynucleotide. polynucleotides of the present invention may be employed to detect the presence and examine the expression patterns of genes in any organism having sufficiently similar DNA and RNA sequences in their cells using techniques that are well known in the art, such as slot Oligonucleotide primers designed using the blot DNA hybridization techniques. polynucleotides of the present invention may be used for PCR amplifications. Oligonucleotide probes and primers designed using the polynucleotides of the present invention may also be used in connection with various microarray technologies, including the microarray technology of Affymetrix (Santa Clara, CA).

In a first aspect, the present invention provides isolated polynucleotide sequences identified in the attached Sequence Listing as SEQ ID NO: 1-62 and 125-162, and polypeptide sequences identified in the attached Sequence Listing as SEQ ID NO: 63-124 and 163-190. The polynucleotides and polypeptides of the present invention have demonstrated similarity to the following polypeptides that are known to be involved in lignin, fructan and tannin biosynthetic processes:

TABLE 1

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		
1 and 125	63 and 163	Fructan biosynthesis	Homolog of Sucrose:Sucrose 1-fructosyltransferase (1-SST) isolated from <i>Festuca arundinacea</i> . They contain a typical signature of the glycosyl hydrolases family 32 (amino acid residues 120 to 133). The glycosyl hydrolases family 32 domain signature has a consensus of HYQPxxH/NxxNDPNG, where D is the active site residue (Henrissat, <i>Biochem. J.</i> 280:309-316, 1991).
2	64	Fructan	Homolog of Sucrose:Sucrose 1-fructosyl-
		biosynthesis	transferase (1-SST) isolated from <i>Festuca</i> arundinacea. It contains a typical signature of the glycosyl hydrolases family 32 (amino acid residues 120 to 133). The glycosyl hydrolases family 32 domain signature has a consensus of HYQPxxH/NxxNDPNG, where D is the active site residue (Henrissat, <i>Biochem. J.</i> 280:309-316, 1991).
3 and 126	65 and 164	Fructan biosynthesis	Homolog of Sucrose:fructan 6-fructosyltransferase (6-SFT) isolated from <i>Festuca arundinacea</i> . They contain a typical signature of the glycosyl hydrolases family 32 (amino acid residues 90 to 564). The glycosyl hydrolases family 32 domain signature has a consensus of HYQPxxH/NxxNDPNG, where D is the active site residue (Henrissat, <i>Biochem. J.</i> 280:309-316, 1991).
4 and 127	66 and 165	Fructan biosynthesis	Homolog of Sucrose:fructan 6-fructosyltransferase (6-SFT) isolated from <i>Lolium</i> perenne. They contain a typical signature of the glycosyl hydrolases family 32 (amino acid residues 96 to 107). The glycosyl hydrolases family 32 domain signature has a consensus of HYQPxxH/NxxNDPNG, where D is the active site residue (Henrissat, <i>Biochem. J.</i> 280:309-316, 1991).
5	67	Fructan biosynthesis	Homolog of sucrose: fructan 6-fructosyltransferase (6-SFT) isolated from <i>Festuca</i> arundinacea.
6 and 128	68 and 166	Fructan biosynthesis	Homolog of Sucrose:fructan 6-fructosyltransferase (6-SFT) isolated from <i>Lolium</i> perenne. They contain a typical signature of the glycosyl hydrolases family 32 (amino acid

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		
			residues 90 to 103). The glycosyl hydrolases family 32 domain signature has a consensus of HYQPxxH/NxxNDPNG, where D is the active site residue (Henrissat, <i>Biochem. J.</i> 280:309-316, 1991).
7 and 129	69	Fructan biosynthesis	Homolog of Sucrose-6-phosphate phosphohydrolase (SPP; EC 3.1.3.24) isolated from Festuca arundinacea. This enzyme belongs to the superfamily of hydrolases, and has the three conserved motifs found in these proteins (Galperin and Koonin, Trends Biochem Sci. 23:127-129, 1998). Motif I (amino acid residues 10 to 19) contains conserved Asp and a Thr residues, motif II (amino acid residues 48 to 53) contains a conserved Thr residue, and Motif III (residues 167 to 220) contains conserved Lys (position 167) and Asp residues (position 202 and 206). These conserved amino acid residues are required for activity of the enzyme.
8	70	Fructan biosynthesis	Homolog of Sucrose-6-phosphate phosphohydrolase (SPP; EC 3.1.3.24) isolated from Lolium perenne. This enzyme belongs to the superfamily of hydrolases, and has the three conserved motifs found in these proteins (Galperin and Koonin, Trends Biochem Sci. 23:127-129, 1998). Motif I (residues 10 to 19) contains conserved Asp and Thr residues, motif II (amino acid residues 48 to 53) contains a conserved Thr residue, and Motif III (amino acid residues 167 to 220) contains conserved Lys (position 167) and Asp residues (position 202 and 206). These conserved amino acid residues are required for activity of the enzyme.
9 and 130	71	Fructan biosynthesis	Homolog of sucrose phosphate synthase (SPS-1) isolated from <i>Festuca arundinacea</i> .
10 and 131	72 and 167	Fructan biosynthesis	Homolog of sucrose phosphate synthase (SPS-1) isolated from <i>Lolium perenne</i> and that is involved in the sucrose synthesis pathway.
11 and 132	73 and 168	Fructan biosynthesis	Homolog of sucrose phosphate synthase (SPS-N) isolated from <i>Lolium perenne</i> and that is involved in the sucrose synthesis pathway.
12 and 133	74 and 169	Fructan	Homolog of sucrose synthase (SuS) isolated

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		
		biosynthesis	from <i>Lolium perenne</i> . These molecules contain a leucine zipper motif in amino acid position 191 to 213. Leucine zipper motifs are present in many gene regulatory proteins (Landschulz <i>et al.</i> , <i>Science</i> 240:1759-1764, 1988).
13	75	Fructan biosynthesis	Homolog of sucrose synthase (SuS) isolated from <i>Festuca arundinacea</i> . This molecule contains a leucine zipper motif in amino acid position 191 to 213. Leucine zipper motifs are present in many gene regulatory proteins (Landschulz <i>et al.</i> , <i>Science</i> 240:1759-1764, 1988).
14 and 134	76 and 170	Fructan biosynthesis	Homolog of sucrose synthase (SuS) isolated from <i>Lolium perenne</i> .
15	77	Fructan biosynthesis	Homolog of sucrose synthase (SuS) isolated from <i>Festuca arundinacea</i> .
16 and 135	78 and 171	Fructan biosynthesis	Homologue of cell wall invertase (CWINV) isolated from <i>Festuca arundinacea</i> that belongs to the family 32 of glycosyl hydrolases. These molecules contain a conserved peptide domain in amino acid residues 139 to 144 and 242-247, respectively. The consensus peptide domain of invertases is (WVYL)EC(PIL)D (LFI) with the conserved Cys residue part of the catalytic domain (Sturm, <i>Plant Physiol</i> . 121:1-7, 1999).
17	79	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from Lolium perenne that belongs to the family 32 of glycosyl hydrolases. This molecule contains a conserved pentapeptide bF-motif at amino acid residues 70 to 74 and a peptide domain in amino acid residues 250 to 255. The consensus peptide domain of invertases is (WVYL)EC(PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, Plant Physiol. 121:1-7, 1999). It also contains a glycosyl hydrolases family 32 signature region at amino acids 61 to 74 that contains a conserved His residue important in the catalytic reaction (Reddy and Maley, J. Biol. Chem. 265:10817-10120, 1990).
18 and 136	80 and 172	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from <i>Lolium perenne</i> that belongs to
10	01	Towns of the second	the family 32 of glycosyl hydrolases. Homolog of cell wall invertase (CWINV)
19	81	Fructan	momorog of cell wall invertage (C WINV)

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide			
			isolated from Festuca arundinacea that belongs to the family 32 of glycosyl hydrolases. This molecule contains a conserved pentapeptide bF-motif at amino acid residues 60 to 64. The consensus peptide domain of invertases is (WVYL)EC(PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, Plant Physiol. 121:1-7, 1999). It also contains a glycosyl hydrolases family 32 signature region at amino acids 51 to 64 that contains a conserved His residue important in the catalytic reaction (Reddy and Maley, J. Biol. Chem. 265:10817-10120, 1990). A signal peptide is present in amino acid residues 1 to 24.
20 and 137	82 and 173	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from <i>Festuca arundinacea</i> that belongs to the family 32 of glycosyl hydrolases. These molecules contain a peptide domain in amino acid residues 61 to 66and 242-247, respectively. The consensus peptide domain of invertases is (WVYL)EC(PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, <i>Plant Physiol</i> . 121:1-7, 1999).
21	83	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from Festuca arundinacea that belongs to the family 32 of glycosyl hydrolases. This molecule contains a conserved pentapeptide bF-motif at amino acid residues 73 to 77 and a peptide domain in amino acid residues 253 to 258. The consensus peptide domain of invertases is (WVYL)EC(PIL)D-(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, Plant Physiol. 121:1-7, 1999). It also contains a glycosyl hydrolases family 32 signature region at amino acid 64 to 77 that contains a conserved His residue important in the catalytic reaction (Reddy and Maley, J. Biol. Chem. 265:10817-10120, 1990).
22 and 138	84 and 174	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from <i>Lolium perenne</i> that belongs to the family 32 of glycosyl hydrolases. These molecules contain a peptide domain in amino acid residues 174 to 179 and 234 to 239,

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		respectively. The consensus peptide domain of invertases is (WVYL)EC- (PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, <i>Plant Physiol</i> . 121:1-7, 1999).
23	85	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from Festuca arundinacea that belongs to the family 32 of glycosyl hydrolases. This molecule contains a conserved pentapeptide bF-motif at amino acid residues 56 to 60. The consensus peptide domain of invertases is (WVYL)EC(PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, Plant Physiol. 121:1-7, 1999). It also contains a glycosyl hydrolases family 32 signature region at amino acid 47 to 60 that contains a conserved His residue that is important in the catalytic reaction (Reddy and Maley, J. Biol. Chem. 265:10817-10120, 1990). A signal peptide is present in amino acid residues 1 to 22.
24 and 139	86 and 175	Fructan biosynthesis	Homolog of cell wall invertase (CWINV) isolated from Lolium perenne that belongs to the family 32 of glycosyl hydrolases. These molecules contain a conserved pentapeptide bF-motif at amino acid residues 244 to 249. The consensus peptide domain of invertases is (WVYL)EC(PIL)D(LFI) with the conserved Cys residue part of the catalytic domain (Sturm, Plant Physiol. 121:1-7, 1999). They also contain a glycosyl hydrolases family 32 signature region at amino acid 56 to 69 that contains a conserved His residue that is important in the catalytic reaction (Reddy and Maley, J. Biol. Chem. 265:10817-10120, 1990). A signal peptide is present in amino acid residues 1 to 25.
25 and 140	87 and 176	Fructan biosynthesis	Homolog of vacuolar invertase (SINV) isolated from <i>Lolium perenne</i> that belongs to the family 32 of glycosyl hydrolases. These molecules contain a conserved pentapeptide bF-motif at amino acid residues 136 to 140 and 138 to 142, respectively and a peptide domain in amino acid residues 317 to 322 and 319 to 324, respectively. The consensus peptide domain of

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		
		!	invertases is (WVYL)EC(PIL)D(LFI) with the
			conserved Cys residue part of the catalytic
			domain (Sturm, Plant Physiol. 121:1-7, 1999).
			It also contains a glycosyl hydrolases family 32
•			signature region at amino acid 127 to 140 and
			129 to 142 that contains a conserved His
			residue that is important in the catalytic
			reaction (Reddy and Maley, J. Biol. Chem.
	00 1177		265:10817-10120, 1990). Homolog of invertase (SINV) isolated from
26 and 141	88 and 177		Lolium perenne that belongs to the family 32 of
		biosynthesis	glycosyl hydrolases. These molecules contain a
			peptide domain in amino acid residues 143 to
			148 and 184 to 189, respectively. The
			consensus peptide domain of invertases is
			(WVYL)EC(PIL)D(LFI) with the conserved
			Cys residue part of the catalytic domain
			(Sturm, <i>Plant Physiol</i> . 121:1-7, 1999).
27	89	Lignin/Tannin	Homolog of 4-Coumarate:CoA ligase (4CL,
		biosynthesis	EC 6.2.1.12) isolated from Lolium perenne The
		J	molecule has two conserved AMP binding
			regions at amino acid residues 182 to 193 and
			383 to 389 (Hu et al., Proc. Natl. Acad. Sci.
			USA 95:5407-5412, 1998). The AMP-binding
			domain signature consists of two binding site
			motifs. The consensus of the first motif is
			LPYSSGTTGLPK (Etchegaray et al.,
			Biochem. Mol. Biol. Int. 44:235-243, 1998).
			The region very rich in glycine, serine, and
			threonine followed by a conserved lysine. In
			most of these proteins, the residue that follows
			the Lys at the end of the pattern is a Gly. The
			second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci.
			USA 95:5407-5412, 1998).
28 and 142	90	Lionin/Tennin	Homolog of 4-Coumarate:CoA ligase (4CL,
28 and 142	90	hiosynthesis	EC 6.2.1.12) isolated from <i>Lolium perenne</i> .
		O103 y11tiles13	The molecule has two conserved AMP binding
			regions at amino acid residues 195 to 206 and
			395 to 401 (Hu et al., Proc. Natl. Acad. Sci.
			USA 95:5407-5412, 1998). The AMP-binding
			domain signature consists of two binding site
			motifs. The consensus of the first motif is
			LPYSSGTTGLPK (Etchegaray et al.,

Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(VI)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). 1	SEQ ID NO	SEQ ID NO	Category	Description
Biochem. Mol. Biol. Int. 44:235-243, 1998. The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). 29 91 Lignin/Tannin Homolog of 4-Coumarate:CoA ligase (4CL, biosynthesis armadinacea. The molecule has two conserved AMP binding regions at amino acid residues 195 to 206 and 395 to 401 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). 30 and 143 92 and 178 Lignin/Tannin biosynthesis GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follow the Lys at the end of the pattern is a Gly. The most of these proteins, the residue that follow the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998).		Polypeptide		
Lignin/Tannin biosynthesis EC 6.2.1.12) isolated from Festuca arundinacea. The molecule has two conserved AMP binding regions at amino acid residues 195 to 206 and 395 to 401 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists o two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray e al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). Homolog of 4-Coumarate:CoA ligase (4CL, EC 6.2.1.12) isolated from Lolium. The molecules have two conserved AMP binding regions at amino acid residues 194 to 205 and 394 to 400 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998).				The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci.
biosynthesis EC 6.2.1.12) isolated from Lolium. The molecules have two conserved AMP binding regions at amino acid residues 194 to 205 and 394 to 400 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sc USA 95:5407-5412, 1998).			biosynthesis	Homolog of 4-Coumarate:CoA ligase (4CL, EC 6.2.1.12) isolated from Festuca arundinacea. The molecule has two conserved AMP binding regions at amino acid residues 195 to 206 and 395 to 401 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998).
	30 and 143	92 and 178		EC 6.2.1.12) isolated from Lolium. The molecules have two conserved AMP binding regions at amino acid residues 194 to 205 and 394 to 400 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a Gly. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci.
31 93 Lignin/Tannin Homolog of 4-Coumarate:CoA ligase (4CL, biosynthesis EC 6.2.1.12) isolated from <i>Festuca</i>	31	93		Homolog of 4-Coumarate: CoA ligase (4CL,

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide			
·			arundinacea. The molecule has two conserved AMP binding regions at amino acid residues 194 to 206 and 482 to 490 (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998). The AMP-binding domain signature consists of two binding site motifs. The consensus of the first motif is LPYSSGTTGLPK (Etchegaray et al., Biochem. Mol. Biol. Int. 44:235-243, 1998). The region very rich in glycine, serine, and threonine followed by a conserved lysine. In most of these proteins, the residue that follows the Lys at the end of the pattern is a GIy. The second motif consensus sequence is GEIC(V/I)RG (Hu et al., Proc. Natl. Acad. Sci. USA 95:5407-5412, 1998).
32 and 144	94 and 179		Homolog of cinnamic acid 4-hydroxylase (C4H) isolated from <i>Lolium perenne</i> . The molecules have a conserved cytochrome P450 region in amino acids 436 to 445 that contains a conserved Cys residue involved in heme binding (Miles <i>et al.</i> , <i>Biochim Biophys Acta</i> 1543:383-407, 2000).
33	95		Homolog of cinnamic acid 4-hydroxylase (C4H) isolated from Festuca arundinacea. The molecule has a conserved Cytochrome P450 region in amino acids 440 to 449 that contains a conserved Cys residue involved in heme binding. The cytochrome P450 cysteine hemeiron ligand signature consensus is FGxGRRSCPG where the conserved C is the heme iron ligand (Miles et al., Biochim. Biophys. Acta 1543:383-407, 2000). It also contains an aldehyde dehydrogenases active site (Hempel et al., Adv. Exp. Med. Biol. 436:53-59, 1999) at amino acid residues 428 to 435. A hydrophobic signal peptide region is present in amino acid residues 1 to 24.
34 and 145	96 and 180	Lignin biosynthesis	Homolog of cinnamyl-alcohol dehydrogenase (CAD; EC 1.1.1.195) isolated from <i>Lolium</i> perenne. These molecules contain a conserved zinc-containing alcohol dehydrogenase domain (Joernvall et al., Eur. J. Biochem. 167:195-201, 1987) in amino acid residues 69 to 83, with a conserved His residue at position 70. They also

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeplide		contain a cytochrome C family heme-binding site signature (Mathews, <i>Prog. Biophys. Mol. Biol.</i> 45:1-56, 1985) in residues 45 to 50.
35	97	Lignin biosynthesis	Homolog of cinnamyl-alcohol dehydrogenase (CAD; EC 1.1.1.195) isolated from Festuca arundinacea. CAD belongs to the family of zinc-binding dehydrogenases. This molecule contains a conserved zinc-containing alcohol dehydrogenases domain (Joernvall et al., Eur. J. Biochem. 167:195-201, 1987) in amino acid residues 69 to 83, with a conserved His residue at position 70. It also contains a Cytochrome C family heme-binding site signature. The cytochrome C family heme-binding site signature is CGICHT. In the cytochrome C protein family, the heme group is covalently attached by thioether bonds to two conserved cysteine residues. The consensus sequence for this site is Cys-X-X-Cys-His and the histidine residue is one of the two axial ligands of the heme iron. This arrangement is shared by all proteins known to belong to cytochrome C family (Mathews, Prog. Biophys. Mol. Biol. 45:1-56, 1985).
36 and 146	98	Lignin biosynthesis	Homolog of caffeoyl coenzyme A O-methyltransferase (CCoAOMT) (EC 2.1.1.104) isolated from <i>Lolium perenne</i> .
. 37	99	Lignin biosynthesis	Homolog of caffeoyl coenzyme A O-methyltransferase (CCoAOMT) (EC 2.1.1.104) isolated from <i>Festuca arundinacea</i> .
38 and 147	100 and 181	Lignin biosynthesis	Homolog of cinnamoyl CoA:NADP oxidoreductase (CCR, EC 1.2.1.44) isolated from <i>Lolium perenne</i> that catalyzes the conversion of cinnamoyl CoA esters to their corresponding cinnamaldehydes in the first specific step in the synthesis of the lignin monomers. A hydrophobic region typical of a signal peptide is present in amino acid residues 1 to 24.
39 and 148	101	Lignin biosynthesis	Homolog of cinnamoyl CoA:NADP oxidoreductase (CCR, EC 1.2.1.44) isolated from <i>Festuca arundinacea</i> that catalyzes the conversion of cinnamoyl CoA esters to their corresponding cinnamaldehydes in the first

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Polypeptide		
			specific step in the synthesis of the lignin
1110	100 1100	T • •	monomers.
40 and 149	102 and 182	Lignin biosynthesis	Homolog of caffeic acid 3-O-methyltransferase (COMT1) isolated from <i>Festuca arundinacea</i> A conserved consensus phosphopantetheine attachment site was identified in amino acid residues 47 to 62. This domain is involved in the attachment of activated fatty acid and amino-acid groups, with the Ser residue at position 52 crucial for the phosphopantetheine attachment (Pugh and Wakil, <i>J. Biol. Chem.</i> 240:4727-4733, 1965).
41 and 150	103	Lignin biosynthesis	Homolog of caffeic acid 3-O-methyltransferase (COMT1) isolated from <i>Lolium perenne</i> A conserved consensus phosphopantetheine attachment site was identified in amino acid residues 47 to 62. This domain is involved in the attachment of activated fatty acid and amino-acid groups, with the Ser residue at position 52 crucial for the phosphopantetheine attachment (Pugh and Wakil, <i>J. Biol. Chem.</i> 240:4727-4733, 1965).
42	104	Lignin biosynthesis	Homolog of caffeic acid 3-O-methyltransferase (COMT1) isolated from <i>Festuca arundinacea</i> A conserved consensus phosphopantetheine attachment site was identified in amino acid residues 47 to 62. This domain is involved in the attachment of activated fatty acid and amino-acid groups, with the Ser residue at position 52 crucial for the phosphopantetheine attachment (Pugh and Wakil, <i>J. Biol. Chem.</i> 240:4727-4733, 1965).
43	105	Lignin biosynthesis	Homolog of caffeic acid 3-O-methyltransferase (COMT1) isolated from <i>Lolium perenne</i> A conserved consensus phosphopantetheine attachment site was identified in amino acid residues 47 to 62. This domain is involved in the attachment of activated fatty acid and amino-acid groups, with the Ser residue at position 52 crucial for the phosphopantetheine attachment (Pugh and Wakil, <i>J. Biol. Chem.</i> 240:4727-4733, 1965).
44 and 151	106 and 183	Lignin biosynthesis	Homolog of ferulate 5-hydroxylase (F5H) isolated from <i>Lolium perenne</i> . The molecules

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide	Рогурершае		have a conserved cytochrome P450 region in amino acids 463 to 472 that contains a conserved Cys residue involved in heme binding (Miles <i>et al.</i> , <i>Biochim Biophys Acta</i> 1543:383-407, 2000). A signal peptide is present in amino acid residues 1 to 30.
45	107	biosynthesis	Homolog of ferulate 5-hydroxylase (F5H) isolated from <i>Festuca arundinaceae</i> . The molecule has a conserved cytochrome P450 region in amino acids 462 to 471 that contains a conserved Cys residue involved in heme binding (Miles <i>et al.</i> , <i>Biochim Biophys Acta</i> 1543:383-407, 2000). A signal peptide is present in amino acid residues 1 to 30.
46 and 152	108	biosynthesis	Homolog of phenylalanine ammonia-lyase (EC 4.3.1.5) (PAL) isolated from <i>Lolium perenne</i> . The polypeptide has a conserved PAL-histidase region in amino acid residues 193 to 209.
47 and 153	109 and 184	biosynthesis	Homolog of phenylalanine ammonia-lyase (EC 4.3.1.5) (PAL) isolated from <i>Festuca</i> arundinacea. A conserved phenylalanine and histidine ammonia-lyases active site signature has been identified in amino acid residues 195 to 210.
48	110	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from Festuca arundinacea. The conserved peroxidase I region is present in amino acid residues 188 to 199 and contains a conserved His residue at position 196 in the active site, and the conserved peroxidase 2 region is present in amino acid residues 60 to 71, with a conserved His residue at position 69 that is involved in heme binding (Kimura and Ikeda-Saito, Proteins 3:113-120, 1988). A signal peptide is present in amino acid residues 1 to 27.
49	111	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from <i>Lolium perenne</i> . The conserved peroxidase I region is present in amino acid residues 199 to 209 and contains a conserved His residue at position 208 in the active site. A signal peptide is present in amino acid residues 1 to 33.
50	112	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from Festuca arundinacea. The conserved

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide			
			peroxidase I region is present in amino acid residues 180 to 190 and contains a conserved His residue at position 188 in the active site, and the conserved peroxidase 2 region is present in amino acid residues 55 to 66, with a conserved His residue at position 64 that is involved in heme binding (Kimura and Ikeda-Saito, <i>Proteins</i> 3:113-120, 1988). A signal peptide is present in amino acid residues 1 to
51 and 154	113	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from Lolium perenne. The conserved peroxidase I region is present in amino acid residues 199 to 209 and contains a conserved His residue at position 207 in the active site, and the conserved peroxidase 2 region is present in amino acid residues 70 to 80, with a conserved His residue at position 78 that is involved in heme binding (Kimura and Ikeda-Saito, Proteins 3:113-120, 1988). A signal peptide is present in amino acid residues 1 to 20.
52 and 155	114	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from <i>Lolium perenne</i> . The conserved peroxidase I region is present in amino acid residues 198 to 208 and contains a conserved His residue at position 206 in the active site (Kimura and Ikeda-Saito, <i>Proteins</i> 3:113-120, 1988). A signal peptide is present in amino acid residues 1 to 34.
53, 156, and 162	115, 185, and 190	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from <i>Lolium perenne</i> . The conserved peroxidase I region is present in amino acid residues 157 to 168, 188 to 199, and 190 to 201, respectively and contain a conserved His residue at position 165, 196 and 198, respectively in the active site, and the conserved peroxidase 2 region is present in amino acid residues 29 to 41, 60 to 72 and 62 to 74, respectively, with a conserved His residue at position 38, 69 and 71, respectively that is involved in heme binding (Kimura and Ikeda-Saito, <i>Proteins</i> 3:113-120, 1988).
54	116	Lignin biosynthesis	Homolog of peroxidase (PER) isolated from Festuca arundinacea. The conserved

SEQ ID NO	SEQ ID NO	Category	Description
Polynucleotide			
			peroxidase I region is present in amino acid residues 176 to 186 and contains a conserved His residue at position 184 in the active site, and the conserved peroxidase 2 region is present in amino acid residues 55 to 67, with a conserved His residue at position 64 that is involved in heme binding (Kimura and Ikeda-Saito, <i>Proteins</i> 3:113-120, 1988). A signal peptide is present in amino acid residues 1 to 22.
55	117	Tannin Biosynthesis	Homolog of chalcone isomerase (CHI) isolated from <i>Lolium perenne</i> . The molecule contains a chalcone isomerase region at amino acid residues 1 to 213.
56	118	Tannin Biosynthesis	Homolog of chalcone isomerase (CHI). The molecule contains a chalcone isomerase region at amino acid residues 23 to 235.
57 and 157	119 and 186	Tannin Biosynthesis	Homolog of Chalcone Synthase (CHS) isolated from <i>Lolium perenne</i> and that is an important enzyme in flavonoid synthesis. The molecules contain a conserved chalcone synthase active site (Lanz <i>et al.</i> , <i>J. Biol. Chem.</i> 266:9971-9976, 1991) at amino acid residues 166 to 175, with the conserved Cys residue at position 167.
58 and 158	120 and 187	Tannin Biosynthesis	Homolog of dihydroflavonal-4-reductase (DFR) isolated from <i>Festuca arundinacea</i> .
59 and 159	121 and 188	Tannin Biosynthesis	Homolog of dihydroflavonal-4-reductase (DFR) isolated from <i>Lolium perenne</i> .
60 and 160	122 and 189	Tannin Biosynthesis	Homolog of dihydroflavonal-4-reductase (DFR) isolated from <i>Lolium perenne</i> . These molecules contain a conserved ATP/GTP binding site at amino acid residues 84 to 91 and 86 to 93, respectively, known as the "A" sequence (Walker <i>et al.</i> , <i>EMBO J.</i> 1:945-951, 1982) or "P-loop" (Saraste <i>et al.</i> , <i>Trends Biochem. Sci.</i> 15:430-434, 1990).
61 and 161	123	Tannin biosynthesis	Homolog of flavanone 3- β hydroxylase (F3 β H) isolated from <i>Lolium perenne</i> .
62	124	Tannin Biosynthesis	Homolog of flavanone 3- β hydroxylase (F3 β H) isolated from <i>Festuca arundinacea</i> .

All the polynucleotides and polypeptides provided by the present invention are isolated and purified, as those terms are commonly used in the art. Preferably, the polypeptides and polynucleotides are at least about 80% pure, more preferably at least about 90% pure, and most preferably at least about 99% pure.

5

10

15

20

25

30

The word "polynucleotide(s)," as used herein, means a polymeric collection of nucleotides, and includes DNA and corresponding RNA molecules and both single and double stranded molecules, including RNAi, HnRNA and mRNA molecules, sense and antisense strands of DNA and RNA molecules, and comprehends cDNA, genomic DNA, and wholly or partially synthesized polynucleotides. A polynucleotide of the present invention may be an entire gene, or any portion thereof. As used herein, a "gene" is a DNA sequence which codes for a functional protein or RNA molecule. Operable anti-sense polynucleotides may comprise a fragment of the corresponding polynucleotide, and the definition of "polynucleotide" therefore includes all operable anti-sense fragments. Anti-sense polynucleotides and techniques involving anti-sense polynucleotides are well known in the art and are described, for example, in Robinson-Benion *et al.*, *Methods in Enzymol.* 254(23): 363-375, 1995 and Kawasaki *et al.*, *Artific. Organs* 20(8): 836-848, 1996.

In specific embodiments, the present invention provides isolated polynucleotides comprising a sequence of SEQ ID NO: 1-62 and 125-162; polynucleotides comprising variants of SEQ ID NO: 1-62 and 125-162; polynucleotides comprising extended sequences of SEQ ID NO: 1-62 and 125-162 and their variants, oligonucleotide primers and probes corresponding to the sequences set out in SEQ ID NO: 1-62 and 125-162 and their variants, polynucleotides comprising at least a specified number of contiguous residues of any of SEQ ID NO: 1-62 and 125-162 (x-mers), and polynucleotides comprising extended sequences which include portions of the sequences set out in SEQ ID NO: 1-62 and 125-162, all of which are referred to herein, collectively, as "polynucleotides of the present invention." Polynucleotides that comprise complements of such polynucleotide sequences, reverse complements of such polynucleotide sequences, together with variants of such sequences, are also provided.

The definition of the terms "complement(s)," "reverse complement(s)," and "reverse sequence(s)," as used herein, is best illustrated by the following example. For the sequence 5' AGGACC 3', the complement, reverse complement, and reverse sequence are as follows:

complement

5

10

15

20

25

30

3' TCCTGG 5'

reverse complement

3' GGTCCT 5'

reverse sequence

5' CCAGGA 3'.

Preferably, sequences that are complements of a specifically recited polynucleotide sequence are complementary over the entire length of the specific polynucleotide sequence.

As used herein, the term "x-mer," with reference to a specific value of "x," refers to a polynucleotide comprising at least a specified number ("x") of contiguous residues of: any of the polynucleotides provided in SEQ ID NO: 1-62 and 125-162. The value of x may be from about 20 to about 600, depending upon the specific sequence.

Polynucleotides of the present invention comprehend polynucleotides comprising at least a specified number of contiguous residues (x-mers) of any of the polynucleotides identified as SEQ ID NO: 1-62 and 125-162, or their variants. Similarly, polypeptides of the present invention comprehend polypeptides comprising at least a specified number of contiguous residues (x-mers) of any of the polypeptides identified as SEQ ID NO: 63-124 and 163-190. According to preferred embodiments, the value of x is at least 20, more preferably at least 40, more preferably yet at least 60, and most preferably at least 80. Thus, polynucleotides of the present invention include polynucleotides comprising a 20-mer, a 40mer, a 60-mer, an 80-mer, a 100-mer, a 120-mer, a 150-mer, a 180-mer, a 220-mer, a 250mer; or a 300-mer, 400-mer, 500-mer or 600-mer of a polynucleotide provided in SEQ ID NO: 1-62 and 125-162, or a variant of one of the polynucleotides corresponding to the polynucleotides provided in SEQ ID NO: 1-62 and 125-162. Polypeptides of the present invention include polypeptides comprising a 20-mer, a 40-mer, a 60-mer, an 80-mer, a 100mer, a 120-mer, a 150-mer, a 180-mer, a 220-mer, a 250-mer; or a 300-mer, 400-mer, 500mer or 600-mer of a polypeptide provided in SEQ ID NO: 63-124 and 163-190, or a variant thereof.

Polynucleotides of the present invention were isolated by high throughput sequencing of cDNA libraries comprising forage grass tissue collected from *Lolium perenne* and *Festuca arundinacea*. Some of the polynucleotides of the present invention may be "partial" sequences, in that they do not represent a full-length gene encoding a full-length polypeptide. Such partial sequences may be extended by analyzing and sequencing various DNA libraries using primers and/or probes and well known hybridization and/or PCR techniques. Partial

sequences may be extended until an open reading frame encoding a polypeptide, a full-length polynucleotide and/or gene capable of expressing a polypeptide, or another useful portion of the genome is identified. Such extended sequences, including full-length polynucleotides and genes, are described as "corresponding to" a sequence identified as one of the sequences of SEQ ID NO: 1-62 and 125-162 or a variant thereof, or a portion of one of the sequences of SEQ ID NO: 1-62 and 125-162 or a variant thereof, when the extended polynucleotide comprises an identified sequence or its variant, or an identified contiguous portion (x-mer) of one of the sequences of SEQ ID NOS: 1-62 and 125-162 or a variant thereof. Similarly, RNA sequences, reverse sequences, complementary sequences, anti-sense sequences and the like, corresponding to the polynucleotides of the present invention, may be routinely ascertained and obtained using the cDNA sequences identified as SEQ ID NOS: 1-62 and 125-162.

10

15

20

25

30

The polynucleotides identified as SEQ ID NOS: 1-62 and 125-162 contain open reading frames ("ORFs") or partial open reading frames encoding polypeptides and Additionally, open reading frames encoding functional portions of polypeptides. polypeptides may be identified in extended or full length sequences corresponding to the sequences set out as SEQ ID NOS: 1-62 and 125-162. Open reading frames may be identified using techniques that are well known in the art. These techniques include, for example, analysis for the location of known start and stop codons, most likely reading frame identification based on codon frequencies, etc. These techniques include, for example, analysis for the location of known start and stop codons, most likely reading frame identification based on codon frequencies, etc. Suitable tools and software for ORF analysis are well known in the art and include, for example, GeneWise, available from The Sanger Center, Wellcome Trust Genome Campus, Hinxton, Cambridge, CB10 1SA, United Kingdom; Diogenes, available from Computational Biology Centers, University of Minnesota, Academic Health Center, UMHG Box 43 Minneapolis MN 55455; and GRAIL, available from the Informatics Group, Oak Ridge National Laboratories, Oak Ridge, Tennessee TN. Once a partial open reading frame is identified, the polynucleotide may be extended in the area of the partial open reading frame using techniques that are well known in the art until the polynucleotide for the full open reading frame is identified.

Once open reading frames are identified in the polynucleotides of the present invention, the open reading frames may be isolated and/or synthesized. Expressible genetic constructs comprising the open reading frames and suitable promoters, initiators, terminators, etc., which are well known in the art, may then be constructed. Such genetic constructs may be introduced into a host cell to express the polypeptide encoded by the open reading frame. Suitable host cells may include various prokaryotic and eukaryotic cells, including plant cells, mammalian cells, bacterial cells, algae and the like.

5

10

15

20

25

30

The polynucleotides of the present invention may be isolated by high throughput sequencing of cDNA libraries prepared from forage grass tissue, as described below in Example 1. Alternatively, oligonucleotide probes and primers based on the sequences provided in SEQ ID NOS: 1-62 and 125-162 can be synthesized as detailed below, and used to identify positive clones in either cDNA or genomic DNA libraries from forage grass tissue cells by means of hybridization or polymerase chain reaction (PCR) techniques. Hybridization and PCR techniques suitable for use with such oligonucleotide probes are well known in the art (see, for example, Mullis et al., Cold Spring Harbor Symp. Quant. Biol., 51:263, 1987; Erlich, ed., PCR technology, Stockton Press: NY, 1989; and Sambrook et al., eds., Molecular cloning: a laboratory manual, 2nd ed., CSHL Press: Cold Spring Harbor, NY, 1989). In addition to DNA-DNA hybridization, DNA-RNA or RNA-RNA hybridization assays are also possible. In the first case, the mRNA from expressed genes would then be detected instead of genomic DNA or cDNA derived from mRNA of the sample. In the second case, RNA probes could be used. Artificial analogs of DNA hybridizing specifically to target sequences could also be employed. Positive clones may be analyzed by restriction enzyme digestion, DNA sequencing or the like.

The polynucleotides of the present invention may also, or alternatively, be synthesized using techniques that are well known in the art. The polynucleotides may be synthesized, for example, using automated oligonucleotide synthesizers (e.g., Beckman Oligo 1000M DNA Synthesizer; Beckman Coulter Ltd., Fullerton, CA) to obtain polynucleotide segments of up to 50 or more nucleic acids. A plurality of such polynucleotide segments may then be ligated using standard DNA manipulation techniques that are well known in the art of molecular biology. One conventional and exemplary polynucleotide synthesis technique involves synthesis of a single stranded polynucleotide segment having, for

example, 80 nucleic acids, and hybridizing that segment to a synthesized complementary 85 nucleic acid segment to produce a 5 nucleotide overhang. The next segment may then be synthesized in a similar fashion, with a 5 nucleotide overhang on the opposite strand. The "sticky" ends ensure proper ligation when the two portions are hybridized. In this way, a complete polynucleotide of the present invention may be synthesized entirely *in vitro*.

5

10

15

20

25

30

Oligonucleotide probes and primers complementary to and/or corresponding to SEQ ID NOS: 1-62 and 125-162, and variants of those sequences, are also comprehended by the present invention. Such oligonucleotide probes and primers are substantially complementary to the polynucleotide of interest over a certain portion of the polynucleotide. An oligonucleotide probe or primer is described as "corresponding to" a polynucleotide of the present invention, including one of the sequences set out as SEQ ID NOS: 1-62 and 125-162 or a variant thereof, if the oligonucleotide probe or primer, or its complement, is contained within one of the sequences set out as SEQ ID NOS: 1-62 and 125-162 or a variant of one of the specified sequences.

Two single stranded sequences are said to be substantially complementary when the nucleotides of one strand, optimally aligned and compared, with the appropriate nucleotide insertions and/or deletions, pair with at least 80%, preferably at least 90% to 95%, and more preferably at least 98% to 100%, of the nucleotides of the other strand. Alternatively, substantial complementarity exists when a first DNA strand will selectively hybridize to a second DNA strand under stringent hybridization conditions.

In specific embodiments, the oligonucleotide probes and/or primers comprise at least about 6 contiguous residues, more preferably at least about 10 contiguous residues, and most preferably at least about 20 contiguous residues complementary to a polynucleotide sequence of the present invention. Probes and primers of the present invention may be from about 8 to 100 base pairs in length, preferably from about 10 to 50 base pairs in length, and more preferably from about 15 to 40 base pairs in length. The probes can be easily selected using procedures well known in the art, taking into account DNA-DNA hybridization stringencies, annealing and melting temperatures, potential for formation of loops, and other factors which are well known in the art. Preferred techniques for designing PCR primers are disclosed in Dieffenbach and Dyksler, *PCR Primer: a laboratory manual*, CSHL Press: Cold Spring Harbor, NY, 1995. A software program suitable for designing probes, and especially for

designing PCR primers, is available from Premier Biosoft International, 3786 Corina Way, Palo Alto, CA 94303-4504.

The isolated polynucleotides of the present invention also have utility in genome mapping, in physical mapping, and in positional cloning of genes.

5

10

15

20

25

30

The polynucleotides identified as SEQ ID NOS: 1-62 and 125-162 were isolated from cDNA clones and represent sequences that are expressed in the tissue from which the cDNA was prepared. RNA sequences, reverse sequences, complementary sequences, anti-sense sequences, and the like, corresponding to the polynucleotides of the present invention, may be routinely ascertained and obtained using the cDNA sequences identified as SEQ ID NOS: 1-62 and 125-162.

Identification of genomic DNA and heterologous species DNA can be accomplished by standard DNA/DNA hybridization techniques, under appropriately stringent conditions, using all or part of a polynucleotide sequence as a probe to screen an appropriate library. Alternatively, PCR techniques using oligonucleotide primers that are designed based on known genomic DNA, cDNA and protein sequences can be used to amplify and identify genomic and cDNA sequences.

In another aspect, the present invention provides isolated polypeptides encoded by the above polynucleotides. As used herein, the term "polypeptide" encompasses amino acid chains of any length, including full-length proteins, wherein the amino acid residues are linked by covalent peptide bonds. The term "polypeptide encoded by a polynucleotide" as used herein, includes polypeptides encoded by a polynucleotide that comprises a partial isolated polynucleotide sequence provided herein. In specific embodiments, the inventive polypeptides comprise an amino acid sequence selected from the group consisting of SEQ ID NO: 63-124 and 163-190, as well as variants of such sequences.

As noted above, polypeptides of the present invention may be produced recombinantly by inserting a polynucleotide sequence of the present invention encoding the polypeptide into an expression vector and expressing the polypeptide in an appropriate host. Any of a variety of expression vectors known to those of ordinary skill in the art may be employed. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a polynucleotide molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, and

higher eukaryotic cells. Preferably, the host cells employed are plant, *E. coli*, insect, yeast, or a mammalian cell line such as COS or293T. The polynucleotide sequences expressed in this manner may encode naturally occurring polypeptides, portions of naturally occurring polypeptides, or other variants thereof. The expressed polypeptides may be used in various assays known in the art to determine their biological activity. Such polypeptides may also be used to raise antibodies, to isolate corresponding interacting proteins or other compounds, and to quantitatively determine levels of interacting proteins or other compounds.

In a related aspect, polypeptides are provided that comprise at least a functional portion of a polypeptide having an amino acid sequence selected from the group consisting of sequences provided in SEQ ID NO: 63-124 and 163-190, and variants thereof. As used herein, the "functional portion" of a polypeptide is that portion which contains an active site essential for affecting the function of the polypeptide, for example, a portion of the molecule that is capable of binding one or more reactants. The active site may be made up of separate portions present on one or more polypeptide chains and will generally exhibit high binding affinity. Functional portions of a polypeptide may be identified by first preparing fragments of the polypeptide by either chemical or enzymatic digestion of the polypeptide, or by mutation analysis of the polynucleotide that encodes the polypeptide and subsequent expression of the resulting mutant polypeptides. The polypeptide fragments or mutant polypeptides are then tested to determine which portions retain biological activity, using methods well known to those of skill in the art, including the representative assays described below.

Portions and other variants of the inventive polypeptides may be generated by synthetic or recombinant means. Synthetic polypeptides having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may be generated using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, J. Am. Chem. Soc. 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied Biosystems, Inc. (Foster City, California), and may be operated according to the manufacturer's instructions. Variants of a native polypeptide may

be prepared using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (Kunkel, *Proc. Natl. Acad. Sci. USA* 82:488-492, 1985). Sections of DNA sequences may also be removed using standard techniques to permit preparation of truncated polypeptides.

5

As used herein, the term "variant" comprehends nucleotide or amino acid sequences different from the specifically identified sequences, wherein one or more nucleotides or amino acid residues is deleted, substituted, or added. Variants may be naturally occurring allelic variants, or non-naturally occurring variants. Variant sequences (polynucleotide or polypeptide) preferably exhibit at least 75%, more preferably at least 80%, more preferably at least 90%, more preferably yet at least 95% and most preferably, at least 98% identity to a sequence of the present invention. The percentage identity is determined by aligning the two sequences to be compared as described below, determining the number of identical residues in the aligned portion, dividing that number by the total number of residues in the inventive (queried) sequence, and multiplying the result by 100.

15

20

10

Polynucleotides and polypeptides having a specified percentage identity to a polynucleotide or polypeptide identified in one of SEQ ID NO: 1-190 thus share a high degree of similarity in their primary structure. In addition to a specified percentage identity to a polynucleotide or polypeptide of the present invention, variant polynucleotides and polypeptides preferably have additional structural and/or functional features in common with a polynucleotide of the present invention. Polynucleotides having a specified degree of identity to, or capable of hybridizing to, a polynucleotide of the present invention preferably additionally have at least one of the following features: (1) they contain an open reading frame, or partial open reading frame, encoding a polypeptide, or a functional portion of a polypeptide, having substantially the same functional properties as the polypeptide, or functional portion thereof, encoded by a polynucleotide in a recited SEQ ID NO:; or (2) they contain identifiable domains in common. Similarly, polypeptides having a specified degree of identity to a polypeptide of the present invention preferably additionally have at least one of the following features: (1) they have substantially the same functional properties as the polypeptide in the recited SEQ ID NO:; or (2) they contain identifiable domains in common.

30

25

Polynucleotide or polypeptide sequences may be aligned, and percentages of identical nucleotides or amino acids in a specified region may be determined against another

polynucleotide or polypeptide, using computer algorithms that are publicly available. The BLASTN and FASTA algorithms, set to the default parameters described in the documentation and distributed with the algorithm, may be used for aligning and identifying the similarity of polynucleotide sequences. The alignment and similarity of polypeptide sequences may be examined using the BLASTP algorithm. BLASTX and FASTX algorithms compare nucleotide query sequences translated in all reading frames against polypeptide sequences. The FASTA and FASTX algorithms are described in Pearson and Lipman, Proc. Natl. Acad. Sci. USA 85:2444-2448, 1988; and in Pearson, Methods in Enzymol. 183:63-98, 1990. The FASTA software package is available from the University of Virginia by contacting the Assistant Provost for Research, University of Virginia, PO Box 9025, Charlottesville, VA 22906-9025. The BLASTN software is available from the National Center for Biotechnology Information (NCBI), National Library of Medicine, Building 38A, Room 8N805, Bethesda, MD 20894. The BLASTN algorithm Version 2.0.11 [Jan-20-2000] and Version 2.2.1 [Apr-13-2001] set to the default parameters described in the documentation and distributed with the algorithm, are preferred for use in the determination of polynucleotide variants according to the present invention. The use of the BLAST family of algorithms, including BLASTN, BLASTP and BLASTX, is described in the publication of Altschul et al., "Gapped BLAST and PSI-BLAST: a new generation of protein database search programs," Nucleic Acids Res. 25:3389-3402, 1997.

10

15

20

25

30

The following running parameters are preferred for determination of alignments and similarities using BLASTN that contribute to the E values and percentage identity for polynucleotides: Unix running command with the following default parameters: blastall -p blastn -d embldb -e 10 -G 0 -E 0 -r 1 -v 30 -b 30 -i queryseq -o results; and parameters are: -p Program Name [String]; -d Database [String]; -e Expectation value (E) [Real]; -G Cost to open a gap (zero invokes default behavior) [Integer]; -E Cost to extend a gap (zero invokes default behavior) [Integer]; -r Reward for a nucleotide match (BLASTN only) [Integer]; -v Number of one-line descriptions (V) [Integer]; -b Number of alignments to show (B) [Integer]; -i Query File [File In]; -o BLAST report Output File [File Out] Optional.

The following running parameters are preferred for determination of alignments and similarities using BLASTP that contribute to the E values and percentage identity of

polypeptide sequences: blastall –p blastp –d swissprotdb –e 10 -G 0 -E 0 –v 30 –b 30 –i queryseq –o results; the parameters are: -p Program Name [String]; -d Database [String]; -e Expectation value (E) [Real]; -G Cost to open a gap (zero invokes default behavior) [Integer]; -E Cost to extend a gap (zero invokes default behavior) [Integer]; -v Number of one-line descriptions (v) [Integer]; -b Number of alignments to show (b) [Integer]; -I Query File [File In]; -o BLAST report Output File [File Out] Optional.

5

10

15

20

25

30

The "hits" to one or more database sequences by a queried sequence produced by BLASTN, BLASTP, FASTA, or a similar algorithm, align and identify similar portions of sequences. The hits are arranged in order of the degree of similarity and the length of sequence overlap. Hits to a database sequence generally represent an overlap over only a fraction of the sequence length of the queried sequence.

As noted above, the percentage identity of a polynucleotide or polypeptide sequence is determined by aligning polynucleotide and polypeptide sequences using appropriate algorithms, such as BLASTN or BLASTP, respectively, set to default parameters; identifying the number of identical nucleic or amino acids over the aligned portions; dividing the number of identical nucleic or amino acids by the total number of nucleic or amino acids of the polynucleotide or polypeptide of the present invention; and then multiplying by 100 to determine the percentage identity. By way of example, a queried polynucleotide having 220 nucleic acids has a hit to a polynucleotide sequence in the EMBL database having 520 nucleic acids over a stretch of 23 nucleotides in the alignment produced by the BLASTN algorithm using the default parameters. The 23-nucleotide hit includes 21 identical nucleotides, one gap and one different nucleotide. The percentage identity of the queried polynucleotide to the hit in the EMBL database is thus 21/220 times 100, or 9.5%. The percentage identity of polypeptide sequences may be determined in a similar fashion.

The BLASTN and BLASTX algorithms also produce "Expect" values for polynucleotide and polypeptide alignments. The Expect value (E) indicates the number of hits one can "expect" to see over a certain number of contiguous sequences by chance when searching a database of a certain size. The Expect value is used as a significance threshold for determining whether the hit to a database indicates true similarity. For example, an E value of 0.1 assigned to a polynucleotide hit is interpreted as meaning that in a database of the size of the EMBL database, one might expect to see 0.1 matches over the aligned portion

of the sequence with a similar score simply by chance. By this criterion, the aligned and matched portions of the sequences then have a probability of 90% of being related. For sequences having an E value of 0.01 or less over aligned and matched portions, the probability of finding a match by chance in the EMBL database is 1% or less using the BLASTN algorithm. E values for polypeptide sequences may be determined in a similar fashion using various polypeptide databases, such as the SwissProt database.

5

10

15

20

25

30

According to one embodiment, "variant" polynucleotides and polypeptides, with reference to each of the polynucleotides and polypeptides of the present invention, preferably comprise sequences having the same number or fewer nucleotides or amino acids than each of the polynucleotides or polypeptides of the present invention and producing an E value of 0.01 or less when compared to the polynucleotide or polypeptide of the present invention. That is, a variant polynucleotide or polypeptide is any sequence that has at least a 99%. probability of being related to the polynucleotide or polypeptide of the present invention, measured as having an E value of 0.01 or less using the BLASTN or BLASTX algorithms set at the default parameters. According to a preferred embodiment, a variant polynucleotide is a sequence having the same number or fewer nucleic acids than a polynucleotide of the present invention that has at least a 99% probability of being related to the polynucleotide of the present invention, measured as having an E value of 0.01 or less using the BLASTN algorithm set at the default parameters. Similarly, according to a preferred embodiment, a variant polypeptide is a sequence having the same number or fewer amino acids than a polypeptide of the present invention that has at least a 99% probability of being related as the polypeptide of the present invention, measured as having an E value of 0.01 or less using the BLASTP algorithm set at the default parameters.

In an alternative embodiment, variant polynucleotides are sequences that hybridize to a polynucleotide of the present invention under stringent conditions. Stringent hybridization conditions for determining complementarity include salt conditions of less than about 1 M, more usually less than about 500 mM, and preferably less than about 200 mM. Hybridization temperatures can be as low as 5°C, but are generally greater than about 22°C, more preferably greater than about 30°C, and most preferably greater than about 37°C. Longer DNA fragments may require higher hybridization temperatures for specific hybridization. Since the stringency of hybridization may be affected by other factors such as

probe composition, presence of organic solvents, and extent of base mismatching, the combination of parameters is more important than the absolute measure of any one alone. An example of "stringent conditions" is prewashing in a solution of 6X SSC, 0.2% SDS; hybridizing at 65°C, 6X SSC, 0.2% SDS overnight; followed by two washes of 30 minutes each in 1X SSC, 0.1% SDS at 65°C and two washes of 30 minutes each in 0.2X SSC, 0.1% SDS at 65°C.

5

10

15

20

25

30

The present invention also encompasses polynucleotides that differ from the disclosed sequences but that, as a consequence of the discrepancy of the genetic code, encode a polypeptide having similar enzymatic activity to a polypeptide encoded by a polynucleotide of the present invention. Thus, polynucleotides comprising sequences that differ from the polynucleotide sequences recited in SEQ ID NO: 1-62 and 125-162, or complements, reverse sequences, or reverse complements of those sequences, as a result of conservative substitutions are contemplated by and encompassed within the present invention. Additionally, polynucleotides comprising sequences that differ from the polynucleotide sequences recited in SEQ ID NO: 1-62 and 125-162, or complements, reverse complements or reverse sequences thereof, as a result of deletions and/or insertions totaling less than 10% of the total sequence length are also contemplated by and encompassed within the present invention. Similarly, polypeptides comprising sequences that differ from the polypeptide sequences recited in SEQ ID NO: 63-124 and 163-190 as a result of amino acid substitutions, insertions, and/or deletions totaling less than 10% of the total sequence length are contemplated by and encompassed within the present invention, provided the variant polypeptide has activity in a lignin, fructan or tannin biosynthetic pathway.

In another aspect, the present invention provides genetic constructs comprising, in the 5'-3' direction, a gene promoter sequence; an open reading frame coding for at least a functional portion of a polypeptide of the present invention; and a gene termination sequence. The open reading frame may be orientated in either a sense or anti-sense direction. For applications where amplification of lignin, fructan or tannin synthesis is desired, the open reading frame may be inserted in the construct in a sense orientation, such that transformation of a target organism with the construct will lead to an increase in the number of copies of the gene and therefore an increase in the amount of enzyme. When down-regulation of lignin, fructan or tannin synthesis is desired, the open reading frame may be

inserted in the construct in an anti-sense orientation, such that the RNA produced by transcription of the polynucleotide is complementary to the endogenous mRNA sequence. This, in turn, will result in a decrease in the number of copies of the gene and therefore a decrease in the amount of enzyme. Alternatively, regulation may be achieved by inserting appropriate sequences or subsequences (e.g., DNA or RNA) in ribozyme constructs.

5

10

15

20

25

30

Genetic constructs comprising a non-coding region of a gene coding for a polypeptide of the present invention, or a nucleotide sequence complementary to a non-coding region, together with a gene promoter sequence and a gene termination sequence, are also provided. As used herein the term "non-coding region" includes both transcribed sequences which are not translated, and non-transcribed sequences within about 2000 base pairs 5' or 3' of the translated sequences or open reading frames. Examples of non-coding regions which may be usefully employed in the inventive constructs include introns and 5'- non-coding leader sequences. Transformation of a target plant with such a genetic construct may lead to a reduction in the amount of lignin, fructan or tannin synthesized by the plant by the process of cosuppression, in a manner similar to that discussed, for example, by Napoli *et al.*, *Plant Cell* 2:279-290, 1990; and de Carvalho Niebel *et al.*, *Plant Cell* 7:347-358, 1995.

The genetic constructs of the present invention further comprise a gene promoter sequence and a gene termination sequence, operably linked to the polynucleotide to be transcribed, which control expression of the gene. The gene promoter sequence is generally positioned at the 5' end of the polynucleotide to be transcribed, and is employed to initiate transcription of the polynucleotide. Gene promoter sequences are generally found in the 5' non-coding region of a gene but they may exist in introns (Luehrsen, *Mol. Gen. Genet.* 225:81-93, 1991). When the construct includes an open reading frame in a sense orientation, the gene promoter sequence also initiates translation of the open reading frame. For genetic constructs comprising either an open reading frame in an anti-sense orientation or a non-coding region, the gene promoter sequence consists only of a transcription initiation site having a RNA polymerase binding site.

A variety of gene promoter sequences which may be usefully employed in the genetic constructs of the present invention are well known in the art. The promoter gene sequence, and also the gene termination sequence, may be endogenous to the target plant host or may be exogenous, provided the promoter is functional in the target host. For example, the

promoter and termination sequences may be from other plant species, plant viruses, bacterial plasmids and the like. Preferably, gene promoter and termination sequences are from the inventive sequences themselves.

5

10

15

20

25

30

Factors influencing the choice of promoter include the desired tissue specificity of the construct, and the timing of transcription and translation. For example, constitutive promoters, such as the 35S Cauliflower Mosaic Virus (CaMV 35S) promoter, will affect the activity of the enzyme in all parts of the plant. Use of a tissue specific promoter will result in production of the desired sense or anti-sense RNA only in the tissue of interest. With DNA constructs employing inducible gene promoter sequences, the rate of RNA polymerase binding and initiation can be modulated by external stimuli, such as light, heat, anaerobic stress, alteration in nutrient conditions and the like. Temporally regulated promoters can be employed to effect modulation of the rate of RNA polymerase binding and initiation at a specific time during development of a transformed cell. Preferably, the original promoters from the enzyme gene in question, or promoters from a specific tissue-targeted gene in the organism to be transformed, such as Lolium or Festuca, are used. Grass promoters different from the original gene may also be usefully employed in the inventive genetic constructs in order to prevent feedback inhibition. For example, the fructosyltransferase gene will be regulated by sucrose sensing systems; therefore removing the gene from under control of its normal promoter allows the gene to be active all the time. Other examples of gene promoters which may be usefully employed in the present invention include, mannopine synthase (mas), octopine synthase (ocs) and those reviewed by Chua et al., Science 244:174-181, 1989.

The gene termination sequence, which is located 3' to the polynucleotide to be transcribed, may come from the same gene as the gene promoter sequence or may be from a different gene. Many gene termination sequences known in the art may be usefully employed in the present invention, such as the 3' end of the *Agrobacterium tumefaciens* nopaline synthase gene. However, preferred gene terminator sequences are those from the original enzyme gene or from the target species to be transformed.

The genetic constructs of the present invention may also contain a selection marker that is effective in plant cells, to allow for the detection of transformed cells containing the inventive construct. Such markers, which are well known in the art, typically confer

resistance to one or more toxins. One example of such a marker is the NPTII gene whose expression results in resistance to kanamycin or hygromycin, antibiotics which are usually toxic to plant cells at a moderate concentration (Rogers et al., in Weissbach A and H, eds., Methods for Plant Molecular Biology, Academic Press Inc.: San Diego, CA, 1988). Alternatively, the presence of the desired construct in transformed cells can be determined by means of other techniques well known in the art, such as Southern and Western blots.

5

10

15

20

25

30

Techniques for operatively linking the components of the inventive genetic constructs are well known in the art and include the use of synthetic linkers containing one or more restriction endonuclease sites as described, for example, by Sambrook *et al.*, (*Molecular cloning: a laboratory manual*, CSHL Press: Cold Spring Harbor, NY, 1989). The genetic construct of the present invention may be linked to a vector having at least one replication system, for example, *E. coli*, whereby after each manipulation, the resulting construct can be cloned and sequenced and the correctness of the manipulation determined.

The genetic constructs of the present invention may be used to transform a variety of plants, both monocotyledonous (e.g., grasses, maize/corn, grains, oats, rice, sorghum, millet, rye, sugar cane, wheat and barley), dicotyledonous (e.g., Arabidopsis, tobacco, legumes, alfalfa, oaks, eucalyptus, maple), and gymnosperms. In a preferred embodiment, the inventive genetic constructs are employed to transform grasses. Preferably the target plant is selected from the group consisting of Lolium and Festuca species, most preferably from the group consisting of Lolium perenne and Festuca arundinacea. Other plants that may be usefully transformed with the inventive genetic constructs include other species of ryegrass and fescue, including, but not limited to Lolium multiflorum (Italian ryegrass), Lolium hybridum (hybrid ryegrass), Lolium rigidum (Wimerra grass), Lolium temulentum (darnel), Festuca rubra (red fescue) and Festuca pratensis (meadow fescue). As discussed above, transformation of a plant with a genetic construct of the present invention will produce a modified lignin, fructan or tannin content in the plant.

The production of RNA in target cells may be controlled by choice of the promoter sequence, or by selecting the number of functional copies or the site of integration of the polynucleotides incorporated into the genome of the target organism. A target plant may be transformed with more than one construct of the present invention, thereby modulating the lignin, fructan and/or tannin biosynthetic pathways by affecting the activity of more than one

enzyme, affecting enzyme activity in more than one tissue or affecting enzyme activity at more than one expression time. Similarly, a construct may be assembled containing more than one open reading frame coding for an enzyme encoded by a polynucleotide of the present invention or more than one non-coding region of a gene coding for such an enzyme. The polynucleotides of the present invention may also be employed in combination with other known sequences encoding enzymes involved in the lignin, fructan and/or tannin biosynthetic pathways. In this manner, more than one biosynthetic pathway may be modulated, or a lignin, fructan or tannin biosynthetic pathway may be added to a plant to produce a plant having an altered phenotype.

5

10

15

20

25

30

Techniques for stably incorporating genetic constructs into the genome of target plants are well known in the art and include Agrobacterium tumefaciens mediated introduction, electroporation, protoplast fusion, injection into reproductive organs, injection into immature embryos, high velocity projectile introduction and the like. The choice of technique will depend upon the target plant to be transformed. For example, dicotyledonous plants and certain monocots and gymnosperms may be transformed by Agrobacterium Ti plasmid technology, as described, for example by Bevan, Nucleic Acid Res. 12:8711-8721, 1984. Targets for the introduction of the genetic constructs of the present invention include tissues, such as leaf tissue, disseminated cells, protoplasts, seeds, embryos, meristematic regions; cotyledons, hypocotyls, and the like. Transformation techniques which may be usefully employed in the inventive methods include those taught by Ellis et al., Plant Cell Reports, 8:16-20, 1989; Wilson et al., Plant Cell Reports 7:704-707, 1989; Tautorus et al., Theor. Appl. Genet. 78:531-536, 198; Hiei et al., Plant J. 6:271-282, 1994; and Ishida et al., Nature Biotechnol. 14:745-750, 1996; US Patent 5,591,616; and European Patent Publication EP 672 752 A1. Once the cells are transformed, cells having the inventive DNA construct incorporated in their genome may be selected by means of a marker, such as the kanamycin resistance marker discussed above. Transgenic cells may then be cultured in an appropriate medium to regenerate whole plants, using techniques well known in the art. In the case of protoplasts, the cell wall is allowed to reform under appropriate osmotic conditions. In the case of seeds or embryos, an appropriate germination or callus initiation medium is employed. For explants, an appropriate regeneration medium is used. Regeneration of plants is well established for many species. The resulting transformed plants may be reproduced

sexually or asexually, using methods well known in the art, to give successive generations of transgenic plants.

5

10

. 15

20

25

30

Polynucleotides of the present invention may also be used to specifically suppress gene expression by methods that operate post-transcriptionally to block the synthesis of products of targeted genes, such as RNA interference (RNAi), and quelling. For a review of techniques of gene suppression see *Science*, 288:1370-1372, 2000. Exemplary gene silencing methods are also provided in WO 99/49029 and WO 99/53050. Posttranscriptional gene silencing is brought about by a sequence-specific RNA degradation process which results in the rapid degradation of transcripts of sequence-related genes. Studies have provided evidence that double-stranded RNA may act as a mediator of sequence-specific gene silencing (see, e.g., review by Montgomery and Fire, *Trends in Genetics*, 14: 255-258, 1998). Gene constructs that produce transcripts with self-complementary regions are particularly efficient at gene silencing. A unique feature of this posttranscriptional gene silencing pathway is that silencing is not limited to the cells where it is initiated. The gene-silencing effects may be disseminated to other parts of an organism and even transmitted through the germ line to several generations.

The polynucleotides of the present invention may be employed to generate gene silencing constructs and or gene-specific self-complementary RNA sequences that can be delivered by conventional art-known methods to plant tissues, such as forage grass tissues. Within genetic constructs, sense and antisense sequences can be placed in regions flanking an intron sequence in proper splicing orientation with donor and acceptor splicing sites, such that intron sequences are removed during processing of the transcript and sense and antisense sequences, as well as splice junction sequences, bind together to form double-stranded RNA. Alternatively, spacer sequences of various lengths may be employed to separate self-complementary regions of sequence in the construct. During processing of the gene construct transcript, intron sequences are spliced-out, allowing sense and anti-sense sequences, as well as splice junction sequences, to bind forming double-stranded RNA. Select ribonucleases bind to and cleave the double-stranded RNA, thereby initiating the cascade of events leading to degradation of specific mRNA gene sequences, and silencing specific genes. Alternatively, rather than using a gene construct to express the self-complementary RNA sequences, the gene-specific double-stranded RNA segments are

delivered to one or more targeted areas to be internalized into the cell cytoplasm to exert a gene silencing effect. Gene silencing RNA sequences comprising the polynucleotides of the present invention are useful for creating genetically modified plants with desired phenotypes as well as for characterizing genes (e.g., in high-throughput screening of sequences), and studying their functions in intact organisms.

Example 1 ISOLATION OF CDNA SEQUENCES FROM L. PERENNE AND F. ARUNDINACEA CDNA LIBRARIES

10

15

20

25

30

5

L. perenne and F. arundinacea cDNA expression libraries were constructed and screened as follows. Tissue was collected from L. perenne and F. arundinacea during winter and spring, and snap-frozen in liquid nitrogen. The tissues collected include those obtained from leaf blades, leaf base, pseudostem, floral stems, inflorescences, roots and stem. Total RNA was isolated from each tissue type using TRIzol Reagent (BRL Life Technologies, Gaithersburg, MD). mRNA from each tissue type was obtained using a Poly(A) Quik mRNA isolation kit (Stratagene, La Jolla, CA), according to the manufacturer's specifications. cDNA expression libraries were constructed from the purified mRNA by reverse transcriptase synthesis followed by insertion of the resulting cDNA in Lambda ZAP using a ZAP Express cDNA Synthesis Kit (Stratagene, La Jolla, CA), according to the manufacturer's protocol. The resulting cDNA clones were packaged using a Gigapack Π Packaging Extract (Stratagene, La Jolla, CA) employing 1 μ l of sample DNA from the 5 μ l ligation mix. Mass excision of the libraries was done using XL1-Blue MRF' cells and XLOLR cells (Stratagene, La Jolla, CA) with ExAssist helper phage (Stratagene, La Jolla, CA). The excized phagemids were diluted with NZY broth (Gibco BRL, Gaithersburg, MD) and plated out onto LB-kanamycin agar plates containing 5-bromo-4-chloro-3-indolyl-beta-D-galactosidase (X-gal) and isopropylthio-beta-galactoside (IPTG). Of the colonies plated and picked for DNA preparations, the large majority contained an insert suitable for sequencing. Positive colonies were cultured in NZY broth with kanamycin and DNA was purified following standard protocols. Agarose gel at 1% was used to screen sequencing templates for chromosomal contamination. Dye terminator sequences were prepared using a

Biomek 2000 robot (Beckman Coulter Inc., Fullerton, CA) for liquid handling and DNA amplification using a 9700 PCR machine (Perkin Elmer/Applied Biosystems, Foster City, CA) according to the manufacturer's protocol.

5

10

15

20

25

30

The DNA sequences for positive clones were obtained using a Perkin Elmer/Applied Biosystems Division Prism 377 sequencer. cDNA clones were sequenced from the 5' end. The polynucleotide sequences identified as SEQ ID NO: 4, 6, 11, 127, 128 and 132 were identified from L. perenne leaf cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 1, 14, 15, 26, 32, 36, 38, 41, 49, 125, 134, 141, 144, 147, and 150 were identified from L. perenne vegetative stem cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 17, 22, 25, 138, and 140 were identified from L. perenne leaf and pseudostem cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 43, 57, 61, 157, and 161 were identified from L. perenne pseudostem cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 10, 12, 28, 30, 34, 44, 60, 131, 133, 142, 143, 145, 151, and 160 were identified from L. perenne floral stem cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 8, 18, 46, 52, 53, 55, 59, 136, 152, 155, 156, 159, and 162 were identified from L. perenne stem cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 51 and 154 were identified from a L. perenne root cDNA expression library; the polynucleotide sequences identified as SEQ ID NO: 24, 27 and 139 were identified from L. perenne leaf blade cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 9, 37, 39, 40, 45, 130, 148, and 149 were identified from F. arundinacea basal leaf cDNA expression libraries; the polynucleotide sequences identified as SEQ ID NO: 19, 21, 29, 33, 35, 47, 48, and 153 were identified from F. arundinacea combined day 3 and day 6 basal leaves cDNA expression libraries; the polynucleotide sequence identified as SEQ ID NO: 54 was identified from a F. arundinacea combined day 3 and day 6 leaves cDNA expression library; the polynucleotide sequence identified as SEQ ID NO: 56 was identified from a F. arundinacea inflorescence cDNA expression library; the polynucleotide sequences identified as SEQ ID NO: 20 and 137 were identified from a subtracted F. arundinacea leaf blade cDNA expression library; the polynucleotide sequences identified as SEQ ID NO: 7, 23, 42, 50, 62, and 129 were identified from F. arundinacea pseudostem cDNA expression libraries; the polynucleotide

sequences identified as SEQ ID NO: 2, 13, 16 and 135 were identified from *F. arundinacea* leaf cDNA expression libraries; and the polynucleotide sequences identified as SEQ ID NO: 3, 5, 31, and 126 were identified from a *F. arundinacea* inflorescence day 0 cDNA expression library.

5

10

15

20

25

30

BLASTN Polynucleotide Analysis

The isolated cDNA sequences were compared to sequences in the EMBL DNA database using the computer algorithm BLASTN. Comparisons of DNA sequences provided in SEQ ID NOS: 1-62 to sequences in the EMBL DNA database were made as of October 19, 2001 using BLASTN algorithm Version 2.0.11 [Jan-20-2000], and the following Unix running command: blastall –p blastn –d embldb –e 10 –G0 –E0 –r 1 –v 30 –b 30 –i queryseq –o. Comparisons of DNA sequences provided in SEQ ID NOS: 125-162 to sequences in the EMBL DNA database were made using BLASTN algorithm Version 2.2.1 [Apr-13-2001], and the following Unix running command: blastall –p blastn –d embldb -F F –e 10 –G0 –E0 –r 1 –v 2 –b 2 –i queryseq –o.

The sequences of SEQ ID NO: 4-6, 9-11, 17-19, 21-26, 33, 44, 45, 48, 49, 51-55, 59, 60, 130-132, 136, 139, 146, 151, 154-156, 159, and 162 were determined to have less than 50% identity to sequences in the EMBL database using the computer algorithm BLASTN, as described above. The sequences of SEQ ID NO: 2, 3, 7, 8, 14, 16, 36-38, 46, 47, 50, 56-58, 61, 129, 135, 137, 138, 152, 153, 157, 158, 160 and 161 were determined to have less than 75% identity to sequences in the EMBL database using the computer algorithm BLASTN, as described above. The sequences of SEQ ID NOS: 1, 12, 13, 15, 20, 28, 31, 32, 35, 40 62, 125-128, 133, 134, 142, 144 and 147 were determined to have less than 90% identity to sequences in the EMBL database using the computer algorithm BLASTN, as described above. Finally, the sequences of SEQ ID NOS: 29, 30, 39, 41-43, 141, 143, 148, and 149 were determined to have less than 98% identity to sequences in the EMBL database using the computer algorithm BLASTN, as described above.

BLASTP Polypeptide Analysis

The protein sequences corresponding to the isolated cDNA sequences were compared to sequences in the SwissProt/Trembl protein database using the computer algorithm

BLASTP. Comparisons of protein sequences provided in SEQ ID NOS: 63-124 to sequences in the SwissProt/Trembl protein database were made as of October 19, 2001 using BLASTP algorithm Version 2.0.11 [Jan-20-2000], and the following Unix running command: blastall –p blastp –dstdb–e 10 –G0 –E0 –v 30 –b 30 –i queryseq –o. Comparisons of protein sequences provided in SEQ ID NOS: 163-190 to sequences in the SwissProt/Trembl protein database were made using BLASTP algorithm Version 2.2.1 [Apr-13-2001], and the following Unix running command: blastall –p blastp –d stdb -F F –e 10 –G0 –E0 –v 2 –b 2 – i queryseq –o.

The sequences of SEQ ID NOS: 65-68, 72, 73, 78, 80, 81, 84, 85, 87, 88, 106, 107, 110,111, 113-115, 117, 118 and 121 were determined to have less than 50% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTP, as described above. The sequences of SEQ ID NOS: 71, 79, 82, 83, 86, 95, 98-100, 112, 116, 120, 122-124, 167, 168, 171-174, 185, 188, and 190 were determined to have less than 75% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTP, as described above. The sequences of SEQ ID NOS: 63, 64, 69, 70, 74-77, 90, 91, 93, 94, 97, 101, 102, 104, 108, 109, 119, 175, 183, 187, and 189 were determined to have less than 90% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTP, as described above. Finally, the sequences of SEQ ID NOS: 89, 92, 96, 103, 105, 163-165, 169, 170, 177, 179, 181, 184, and 186 were determined to have less than 98% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTP, as described above.

BLASTX Polynucleotide Analysis

5

10

15

20

25

30

The isolated cDNA sequences were compared to sequences in the SwissProt/Trembl protein database using the computer algorithm BLASTX. Comparisons of DNA sequences provided in SEQ ID NOS: 1-62 to sequences in the SwissProt/Trembl protein database were made as of October 19, 2001 using BLASTX algorithm Version 2.0.11 [Jan-20-2000], and the following Unix running command: blastall –p blastx –dstdb –e 10 –G0 –E0 –v 30 –b 30 –i queryseq –o. Comparisons of DNA sequences provided in SEQ ID NOS: 1-62 to sequences in the SwissProt/Trembl protein database were made using BLASTX algorithm

Version 2.2.1 [Apr-13-2001], and the following Unix running command: blastall –p blastx – d stdb -F F –e 10 –G0 –E0 –v 2 –b 2 –i queryseq –o.

The sequences of SEQ ID NOS: 11, 44, 45, 48, 49, 51, 52, 55, 130, 132, 155, 156, and 162 were determined to have less than 50% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTX, as described above. The sequences of SEQ ID NOS: 3-10, 16-26, 33, 36-38, 40-43, 50, 53, 54, 56, 58-62, 129, 131, 135-139, 146, 150, 151, 154, and 158-161 were determined to have less than 75% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTX, as described above. The sequences of SEQ ID NOS: 1, 2, 12-15, 27, 28-32, 34, 35, 39, 46, 47, 57, 125-128, 133, 134, 141-145, 147-149, 152, 153, and 157 were determined to have less than 90% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTX, as described above. Finally, the sequence of SEQ ID NO: 140 was determined to have less than 98% identity to sequences in the SwissProt/Trembl database using the computer algorithm BLASTX, as described above.

The location of open reading frames (ORFs), by nucleotide position, contained within the sequences of SEQ ID NO: 1-62 and 125-162, and the corresponding amino acid sequences are provided in Table 2 below. SEQ ID NO: 1-8, 10-15, 17, 19, 21, 23-25, 28-52, 54-59, 61-62 and 125-162 are believed to contain full-length ORFs.

20 TABLE 2

5

10

15

POLYNUCLEOTIDE	ORF	POLYPEPTIDE
SEQ ID NO:		SEQ ID NO:
1	56-2,020	63
2	64-2,010	64
3	64-1,926	65
4	74-1,945	66
5	40-1,911	67
6	79-1,938	68
7	246-1,514	69
8	264-1,532	70
9	84-3,272	71
10	73-3,297	72
11	129-2,942	73
12	46-2,472	74
13	113-2,539	75
14	61-2,505	76

POLYNUCLEOTIDE SEO ID NO:	OLYNUCLEOTIDE ORF SEQ ID NO:		
15	103-2,253	SEQ ID NO: 77	
16	3-1,439	78	
17	26-1,777	79	
18	2-1,174	80	
19	59-1,852	81	
20	2-1,201	82	
21	1-1,779	83	
22	198-1,097	84	
23	27-1,772	85	
24	36-1,802	86	
25	78-2,084	87	
26	2-1,423	88	
27	3-1,622	89	
28	85-1,764	90	
29	72-1,751	91	
30	127-1,800	92	
31	137-1,810	93	
32	62-1,567	94	
	80-1,597	95	
33		96	
34	32-1,117 86-1,171	97	
35	55-852	98	
36	75-872	99	
37		100	
38	149-1,240	101	
39	90-1,118	102	
40	28-1,110	103	
41	66-1,148	104	
42	64-1,146	105	
43	85-1,170	106	
44	88-1,683	106	
45	93-1,721		
46	111-2,246	108	
47	144-2,285	109	
48	22-993	110	
49	4-1,038	111	
50	87-1,067	112	
51	59-1,135	113	
52	18-1,052	114	
53	1-882	115	
54	80-1,015	116	
55	322-1,014	117	
56	172-762	118	
57	118-1,299	119	

POLYNUCLEOTIDE		
SEQ ID NO:		SEQ ID NO:
58	5-595	120
59	14-1,003	121
60	1-987	122
61	65-1,174	123
62	103-1,245	124
125	55-2,019	163
126	63-1,925	164
127	73-1,944	165
128	71-1,930	166
131	72-3,299	167
132	134-2,950	168
133	45-2,471	169
134	65-2,512	170
135	74-1,819	171
136	170-1,855	172
137	28-1,770	173
138	26-1,733	174
139	35-1,801	175
140	71-2,083	176
141	63-1,607	177
143	126-1,799	178
144	61-1,566	179
145	67-1,152	180
147	148-1,239	181
149	27-1,109	182
151	87-1,718	183
153	143-2,284	184
156	46-1,017	185
157	117-1,313	186
158	81-1,193	187
159	12-1,001	188
160	26-1,018	189
162	50-1,027	190

SEQ ID NO: 125 and 163 are related to SEQ ID NO: 1 and 63, respectively; SEQ ID NO: 126 and 164 are related to SEQ ID NO: 3 and 65, respectively; SEQ ID NO: 127 and 165 are related to SEQ ID NO: 4 and 66, respectively; SEQ ID NO: 128 and 166 are related to SEQ ID NO: 6 and 68, respectively; SEQ ID NO: 129 is an extended sequence of SEQ ID NO: 7; SEQ ID NO: 130 is an extended sequence of SEQ ID NO: 9; SEQ ID NO: 131 and 167 are related to SEQ ID NO: 10 and 72, respectively; SEQ ID NO: 132 and 168 are related

5

10

15

20

25

30

to SEQ ID NO: 11 and 73, respectively; SEQ ID NO: 133 and 169 are related to SEQ ID NO: 12 and 74, respectively; SEQ ID NO: 134 and 170 are related to SEQ ID NO: 14 and 76, respectively; SEQ ID NO: 135 and 171 are full-length sequences of SEQ ID NO: 16 and 78, respectively; SEQ ID NO: 136 and 172 are full-length sequences of SEQ ID NO: 18 and 80, respectively; SEQ ID NO: 137 and 173 are related to SEQ ID NO: 20 and 82, respectively; SEQ ID NO: 138 and 174 are full-length sequences of SEQ ID NO: 22 and 84, respectively; SEQ ID NO: 139 and 175 are related to SEQ ID NO: 24 and 86, respectively; SEQ ID NO: 140 and 176 are related to SEQ ID NO: 25 and 87, respectively; SEQ ID NO: 141 and 177 are full-length sequences of SEQ ID NO: 26 and 88, respectively; SEQ ID NO: 142 is related to SEQ ID NO: 28 and encodes the same amino acid sequence; SEQ ID NO: 143 and 178 are related to SEQ ID NO: 30 and 92, respectively; SEQ ID NO: 144 and 179 are related to SEQ ID NO: 32 and 94, respectively; SEQ ID NO: 145 and 180 are full-length sequences of SEQ ID NO: 34 and 96, respectively; SEQ ID NO: 146 is related to SEQ ID NO: 36 and encodes the same amino acid sequence; SEQ ID NO: 147 and 181 are related to SEQ ID NO: 38 and 100, respectively; SEQ ID NO: 148 is related to SEQ ID NO: 39, and encodes the same amino acid sequence; SEQ ID NO: 149 and 182 are related to SEQ ID NO: 40 and 102, respectively; SEQ ID NO: 150 is related to SEQ ID NO: 41 and encodes the same amino acid sequence; SEQ ID NO: 151 and 183 is related to SEQ ID NO: 44 and 106, respectively; SEQ ID NO: 152 is related to SEQ ID NO: 46, and encodes the same amino acid sequence; SEQ ID NO: 153 and 184 are related to SEQ ID NO: 47 and 109, respectively; SEQ ID NO: 154 is related to SEQ ID NO: 51, and encodes the same amino acid sequence; SEQ ID NO: 155 is related to SEQ ID NO: 52, and encodes the same amino acid sequence; SEQ ID NO: 156 and 185 are full-length sequences of SEQ ID NO: 53 and 115, respectively; SEQ ID NO: 162 and 190 are variants of SEQ ID NO: 156 and 185, respectively, with a difference in the 5' region of SEQ ID NO: 156 and 162; SEQ NO: 157 and 186 are related to SEQ ID NO: 57 and 119, respectively; SEQ ID NO: 158 and 187 are related to SEQ ID NO: 58 and 120, respectively; SEQ ID NO: 159 and 188 are full-length sequences of SEQ ID NO: 59 and 121, respectively; SEQ ID NO: 160 and 189 are full-length sequences of SEQ ID NO: 60 and 122, respectively; and SEQ ID NO: 161 is related to SEQ ID NO: 61 and encodes the same amino acid sequence.

Example 2

USE OF SUCROSE PHOSPHATE PHOSPHATASE TO DEPHOSPHORYLATE SUCROSE-6-PHOSPHATE

The *F. arundinacea* and *L. perenne* FaSPP and LpSPP genes (SEQ ID NO: 7 and 8, respectively) share amino acid sequence identity with sucrose-6-phosphate phosphatase genes from other plant species (Lunn *et al.*, *Proc. Natl. Acad. Sci. USA* 97:12914-12919, 2000). These genes were amplified by PCR using the primers given in SEQ ID NO: 191 and 192 to add an initiating methionine, and then cloned into the pET41a expression plasmid. These primers amplified nucleotides 263-1531 and 280-1548 for FaSPP and LpSPP, respectively. The resulting plasmids were transformed into *E. coli* BL21 cells using standard protocols, and protein expression was induced using IPTG.

The soluble recombinant protein was assayed for its ability to specifically dephosphorylate sucrose-6-phosphate (Suc-6-P) but not fructose-6-phosphate (Fru-6-P) using the procedure described by Lunn *et al.* (*ibid.*). The release of phosphate from Suc-6P and Fru-6-P was measured using the Fiske-Subbarow method of determining inorganic phosphate (SIGMA assay kit; Sigma, St Louis, MI), with the change in absorbance at 660 nm being proportional to the amount of phosphate released per unit time. As shown in Fig. 1, both the *Festuca* and *Lolium* SPP enzymes dephosphorylated Suc-6-P but not Fru-6-P, whereas control pET41 extract had no activity on either substrate.

2Ó

5

10

15

Example 3

PEROXIDASE ACTIVITY OF GRASS ENZYMES DEMONSTRATED BY THEIR ABILITY TO OXIDIZE 2,2'AZINO-BIS.3-ETHYLBENZYLTHIAZOLINE-6-SULFONIC ACID (ABTS)

25

30

A number of *L. perenne* or *F. arundinacea* genes (SEQ ID NO: 48 – 54) share amino acid identity with peroxidase genes from other plant species (Hiraga *et al.*, *Plant Cell Physiol*. 42:462-468, 2001). The putative amino acid secretion signal sequence was identified by signalP analysis of the *Lolium* and *Festuca* sequences and homology to known peroxidase proteins. Primers were designed to amplify DNA representing the mature protein (minus signal sequence; Table 3.). These genes were amplified by PCR to add an initiating methionine and then cloned into the pET25b expression plasmid. The resulting plasmid was

transformed into E. coli AD494 (DE3) pLysS cells using standard protocols, and protein expression was induced using IPTG.

TABLE 3

SEQ ID NO DNA	SEQ ID NO PROT	Gene	Primers SEQ ID NO:	DNA bp amplified	Protein codons
50	112	FaPER3	193 194	156-1077	24-326
52	114	LpPER5	195 196	120-1052	35-344

5

10

15

The insoluble recombinant protein was solubilized and re-folded following protocols described for several recombinant *Arabidopsis* peroxidases (Teilum *et al.*, *Protein Exp. and Purif.* 15:77-82, 1999). The insoluble inclusion bodies within *E. coli* were isolated from lysed cells by standard protocols and the recombinant protein solubilized in 8M urea. The solubilized peroxidase protein was refolded to gain active enzyme by diluting urea to 2M with 5µM Heme, 0.25mM Glutathione reduced, and 0.45mM Glutathione oxidized, pH 8 (20mM Tris-HCl). The refolded protein was used directly to assay peroxidase activity.

Peroxidase activity was measured by incubating recombinant peroxidase with premixed ABTS/H₂O₂ liquid substrate (Sigma, St Louis, MI) and measuring ABTS oxidation by the increase in absorbance at 405nm. Horseradish peroxidase of known activity (Sigma, St Louis, MI) was used as a positive control and boiled samples as a negative control. The results provided in Fig. 2 show that FaPER3 and LpPER5 (SEQ ID NO: 50 and 52, respectively) had similar activity to that of horseradish peroxidase in these assays.

20

25

Example 4 USE OF GRASS FRUCTOSYLTRANSFERASE GENES TO SYNTHESIZE FRUCTANS

Transformation of N. benthamiana plants with fructosyltransferase genes

Sense constructs containing a polynucleotide including the coding region of fructosyltransferase genes isolated from *L. perenne* Lp1-SST and Lp6SFT1 (SEQ ID NO: 125 and 126, respectively) were inserted into a pART27 derived binary vector and used to

transform A. tumefaciens LBA4404 using published methods (see, An et al., "Binary Vectors," in Gelvin and Schilperoort, eds., Plant Molecular Biology Manual, Kluwer Academic Publishers: Dordrecht, 1988). The presence and integrity of the binary vector in A. tumefaciens was verified by polymerase chain reaction (PCR). The primers px17 (SEQ ID NO: 207) and px18 (SEQ ID NO: 208) were used to confirm the presence of the Lp1-SST construct, whereas the primers px19 (SEQ ID NO: 209) and px 20 (SEQ ID NO: 210) were used to confirm the presence of the Lp6-SFT-1 construct.

The A. tumefaciens containing the sense gene constructs were used to transform N. benthamiana leaf discs (Burow et al., Plant Mol. Biol. Report 8:124-139, 1990). Several independent transformed plant lines were established for the sense construct for each fructosyltransferase gene. DNA was isolated from transformed plants containing the appropriate fructosyltransferase gene construct using the QIAGEN DNAeasy Plant Mini Kit (Qiagen, Valencia, CA). Presence of the fructosyltransferase gene was verified using PCR experiments as shown in Figs. 3 and 4. For the Lp6-SFT1 gene, the forward and reverse primers given in SEQ ID NO: 197 and 198 were used, respectively. These primers amplify nucleotides 1572 - 1980 of the Lp6-SFT1 gene which corresponds to a 406 base pair fragment. For Lp1-SST, the forward and reverse primers given in SEQ ID NO: 199 and 200 were used, respectively. These primers amplify nucleotides 1332 - 1740 of Lp1-SST, corresponding to a 414 base pair fragment.

20

25

30

5

10

15

Effects of fructosyltransferase genes on fructosyltransferase concentration in transformed plants

Fructans are not normally found in N. benthamiana plants; hence, if introduction of the sense fructosyltransferase constructs was successful, it should be possible to extract fructans from the transformed plants. The concentration of fructosyltransferase in the transformed plants was determined using the Fructan Assay Kit (Megazyme International Ireland Ltd, Wicklow, Ireland). Briefly, 300 mg of leaf material from the independent transformed plant lines containing the fructosyltransferase sense constructs were extracted individually at 80 °C with 1 ml 80% ethanol, followed by two 1 ml extractions with water. The ethanol and water extracts were combined and frozen overnight at -20 °C. Extracts were centrifuged at 20,000 g to pellet chlorophyll. Clarified extracts were treated with 1%

PVP-40 to precipitate phenolic compounds. These extracts were then reduced in volume by rotary evaporation.

Fructan levels were determined in these extracts using the Megazyme Fructan Assay kit. Briefly, sucrose, starch and reducing sugars are removed from the plant carbohydrate extracts by using sucrase, β-amylase, pullulanase and maltase, and then converting the resulting reducing sugars to sugar alcohols. The remaining fructans are hydrolyzed with fructanase and the reducing sugars produced (glucose and fructose) are measured by the 4-hydroxybenzoic acid hydrazide (PAHBAH) reducing sugar method. The final extracts are assayed for absorbance at 410 nm. As shown in Fig. 5, fructans could be detected in both the Lp1-SST and Lp6-SFT-1 transgenic lines. Fructan levels were highest in lines 07, 09 and 12 for Lp1-SST, and lines 05 and 12 for Lp6SFT-1.

Example 5

USE OF SUCROSE PHOSPHATE SYNTHASE ENZYMES TO SYNTHESIZE SUCROSE

15

20

25

30

. 5

10

A F. arundinacea gene (FaSPS-N; SEQ ID NO: 9) has been identified that shares amino acid sequence identity with sucrose phosphate synthase (SPS) from other plant species. SEQ ID NO: 7 and 8 are also SPS sequences, with SEQ ID NO: 7 being a Lolium perenne homologue of SEQ ID NO: 9. The FaSPS-N was cloned into the pcDNA3 mammalian expression plasmid and the resulting plasmid transfected into 293T mammalian cells (human embryonic kidney derived cells) using Lipofectamine 2000 reagent (Invitrogen, Carlsbad, CA).

Cell lysates from transfected cells were deionized on G25 spin columns and used in a sucrose synthesis assay. In this assay, mammalian cell extracts were tested for their ability to synthesize sucrose from fructose-6-phosphate and uridine 5'-diphosphoglucose. Following the synthesis reaction, hexoses were converted to sugar alcohols by boiling in the presence of 30% KOH. The sucrose synthesized was detected by the addition of 1.4 % anthrone reagent in H₂SO₄ and incubating at 40 °C for 20 min. The change in absorbance at 620 nm is relative to sucrose in the reaction (Botha and Black, *Aust. J. Plant Physiol.* 27:81-85, 2000). In these experiments, introducing FaSPS-N alone into mammalian cells produced a sucrose synthesis activity that was not detected in non-transfected cells (Fig. 6).

A known cofactor for SPS is SPP. To test whether SPP is required for SPS activity, the *L. perenne* LpSPP gene (SEQ ID NO: 8) was cloned into the pcDNA3 mammalian expression plasmid. Both the FaSPS-N and LpSPP plasmids were co-transfected into 293T mammalian cells using Lipofectamine 2000 reagent (Invitrogen, Carlsbad, CA). Cell lysates from transfected cells were deionized on G25 spin columns and used in a sucrose synthesis assay as described above. As shown in Fig. 6, adding SPP did not significantly enhance or alter the sucrose synthesis activity of the cell extracts.

5

10

15

20

25

Example 6

USE OF SOLUBLE SUCROSE SYNTHASE ENZYMES TO CLEAVE SUCROSE

A F. arundinacea gene (FaSUS-1; SEQ ID NO: 13) was identified that shared amino acid sequence identity with soluble sucrose synthase enzymes (SUS) from other plant species. The FaSUS-1 gene was cloned into the pcDNA3 mammalian expression plasmid, which was transiently transfected into 293T mammalian cells (human embryonic kidney derived cells) using Lipofectamine 2000 reagent (Invitrogen Carlsbad, CA). Transfected cells were grown for several days before harvesting (by scraping cells in a sucrose synthase buffer). Harvested cells were frozen on dry ice and freeze-thawed twice before pelleting cell debris by centrifugation. The resulting supernatant (cell lysate) was deionized on G25 spin columns and then used in a sucrose cleavage assay as described by Sebkova et al. (Plant Physiol. 108:75-83, 1995). In these assays, the cell lysates were tested for their ability to cleave sucrose in the presence of UDP to produce fructose and uridine 5'-diphosphoglucose. Following a 30 min incubation at 30 °C, the enzyme activity was stopped by boiling the tubes for 1 min. Both NAD and UDP-glucose dehydrogenase were added and the change in OD at 340 nM (production of NADPH) was measured. As shown in Fig. 7, significantly higher levels of sucrose cleavage were observed in cells transfected with FaSUS1 construct than in non-transfected control cells.

Example 7

USE OF ACID INVERTASES TO CLEAVE SUCROSE

A number of acid (vacuolar and cell wall) invertase genes from *L. perenne* and *F. arundinacea* (SEQ ID NOS: 17, 19, 21, 23 and 135-141) were identified that share amino acid sequence identity with acid invertases from other plant species (Unger *et al.*, *Plant Physiol.* 104:1351-1357, 1994; Goetz and Roitsch, *J. Plant Physiol.* 157:581-585, 2000). These sequences were analysed by SignalP and homology to identify signal regions and propeptide sequences, and primers were designed to amplify the DNA sequence encoding the mature protein (Table 4).

5

10

15

20

25

TABLE 4

SEQ ID NO DNA	SEQ ID NO PROT	Gene	Primers SEQ ID NO	DNA bp amplified	Protein codons
17	79	LpCWINV1	201 202	137-1803	38-583
19	81	FaCWINV4	203 204	134-1912	26-597
25	87	LpSINV1	205 206	387-2124	104-668

The PCR fragments were cloned into pPICZαA vectors for expression in methylotrophic yeast *Pichia pastoris* (EasySelect TM Pichia Expression Kit, Invitrogen, Carlsbad, CA). The sequences were cloned in frame with the α-mating factor for secretion of the recombinant invertase protein into liquid media, following similar methods described for the expression of barley 6-SFT and fescue 1-SST in *P. pastoris* (Hochstrasser *et al., FEBS Letters* 440:356-360, 1998; Lüscher *et al., Plant Physiol.*, 124:1217-1227, 2000). The media was concentrated 10 fold by Vivaspin 30 kDa spin column (VivaScience, Hannover, Germany) to concentrate recombinant protein and used directly to assay invertase activity. Recombinant protein was assayed with 100mM sucrose in 500 μl phosphate buffer pH5.0, at 30 °C for 1 hour. Release of glucose by invertase activity was measured using a glucose HK assay kit (Sigma, St Louis, MI). Fig. 8 shows the glucose released by invertase activity in terms of glucose concentration in the assay mix. As shown in Fig. 8, invertase activity was observed for the vacuolar invertase (LpSINV1; SEQ NO: 25) and the two cell wall invertases

(LpCWINV1 and FaCWINV4; SEQ NO: 17 and 19, respectively) but not for an empty vector (pPICZalphaA) control.

Example 8

USE OF TANNIN GENES TO MODIFY TANNIN BIOSYNTHESIS

Certain Arabidopsis mutants of the transparent testa (tt) phenotype do not make the anthocyanin pigment cyanidin and therefore have no seed coat color. The genes responsible for many of these mutants have now been identified as shown in Table 5.

10 TABLE 5

5

15

20

25

Enzyme	Abbreviation	Locus	Chromosome
Dihydroflavanol-4-reductase	DFR	tt3	5
Chalcone synthase	CHS	tt4	5
Chalcone isomerase	CHI	tt5	3
Flavanone 3- β-hydroxylase	F3βH	tt6	3

Over-expression of the maize genes for CHS, CHI and DFR has been shown to complement the *Arabidopsis tt4*, *tt5* and *tt3* mutants, respectively, thereby restoring cyanidin synthesis and seed coat color (Dong *et al.*, *Plant Physiol.* 127:46-57, 2001). Complementation of these *Arabidopsis* mutants may therefore be employed to demonstrate the function of the inventive polynucleotides encoding enzymes involved in the tannin biosynthetic pathway.

Sense constructs containing a polynucleotide including the coding region of tannin genes isolated from *L. perenne* or *F. arundinacea* LpCHS, LpCHI, LpF3βH, LpDFR1, FaCHI and FaF3βH (SEQ ID NO: 157, 55, 161, 159, 56 and 62, respectively) under the control of the CaMV 35S promoter were inserted into a binary vector and used to transform *Agrobacterium tumefaciens* LBA4404 using published methods (*see*, An G, Ebert PR, Mitra A, Ha SB, "Binary Vectors," *in* Gelvin SB, Schilperoort RA, eds., *Plant Molecular Biology Manual*, Kluwer Academic Publishers: Dordrecht, 1988). The presence and integrity of the binary vector in *A. tumefaciens* was verified by polymerase chain reaction (PCR) using the primer pairs described in Table 6.

TABLE 6

Gene	SEQ ID NO:	Transparent testa line	Forward Primer SEQ ID NO:	Reverse Primer SEQ ID NO:
LpCHS	157	tt4	211	212
LpCHI	55	tt5	213	214
LpF3βH	161	tt6	217	218
LpDFR1	159	tt3	215	216
FaCHI	56	tt5	213	214
FaF3βH	62	tt6	217	218

The A. tumefaciens containing the sense gene constructs are used to transform Arabidopsis by floral dipping (Clough and Bent, Plant J. 16:735-743, 1998). Several independent transformed plant lines were established for the sense construct for each of the tannin genes. Specifically, LpDFR1 constructs were transformed into Arabidopsis tt3 mutants, LpCHS constructs were transformed into Arabidopsis tt4 mutants, LpCHI and FaCHI constructs were transformed into Arabidopsis tt5 mutants, and LpF3βH and FaF3βH constructs were transformed into Arabidopsis tt6 mutants. Several independent transformed plant lines were established for the construct for each of the tannin genes. Transformed plants containing the appropriate tannin gene construct were verified using PCR.

5

10

15

20

The presence of cyanidin in the FaCHI transformed plants is demonstrated by a phenotypic change in plant seedling color and by analyzing cyanidin extracts made from transgenic plants grown under stressed conditions (Dong *et al.*, *Plant Physiol.* 127:46-57, 2001). Briefly, cyanidins are extracted from plant tissue with an acid/alcohol solution (HCl/methanol) and water. Chlorophyll is removed by freezing the extracts followed by centrifugation at 4 °C at 20,000 g for 20 min. Any remaining chlorophyll is removed through a chloroform extraction. The absorbance at 530 nm is measured for each of the cyanidin extracts. Non-transgenic wild type and control *Arabidopsis* plants are used as controls.

SEQ ID NOS: 1-218 are set out in the attached Sequence Listing. The codes for nucleotide sequences used in the attached Sequence Listing, including the symbol "n," conform to WIPO Standard ST.25 (1998), Appendix 2, Table 1.

All references cited herein, including patent references and non-patent publications, are hereby incorporated by reference in their entireties.

5

10

While in the foregoing specification this invention has been described in relation to certain preferred embodiments, and many details have been set forth for purposes of illustration, it will be apparent to those skilled in the art that the invention is susceptible to additional embodiments and that certain of the details described herein may be varied considerably without departing from the basic principles of the invention.

Claims

We claim:

1. An isolated polynucleotide comprising a sequence selected from the group consisting of:

- (a) SEQ ID NO: 1-62 and 125-162;
- (b) complements of SEQ ID NO: 1-62 and 125-162;
- (c) reverse complements of SEQ ID NO: 1-62 and 125-162; and
- (d) reverse sequences of SEQ ID NO: 1-62 and 125-162;
- 2. An isolated polynucleotide comprising a sequence selected from the group consisting of:
 - (a) sequences having a 99% probability of being functionally or evolutionarily related to a sequence of SEQ ID NO: 1-62 and 125-162;
 - (b) sequences having at least 75% identity to a sequence of SEQ ID NO: 1-62 and 125-162:
 - (c) sequences having at least 90% identity to a sequence of SEQ ID NO: 1-62 and 125-162; and
 - (d) sequences having at least 95% identity to a sequence of SEQ ID NO: 1-62 and 125-162,

wherein the polynucleotide encodes a polypeptide having substantially the same functional properties as a polypeptide encoded by SEQ ID NO: 1-62 and 125-162.

- 3. An isolated oligonucleotide probe or primer comprising at least 10 contiguous residues complementary to 10 contiguous residues of a nucleotide sequence recited in claim 1.
- 4. A kit comprising a plurality of oligonucleotide probes or primers of claim 3.
- 5. A genetic construct comprising an isolated polynucleotide of any one of claims 1 and

2.

6. A transgenic cell comprising a construct according to claim 5.

- 7. A construct comprising, in the 5'-3' direction:
 - (a) a gene promoter sequence;
 - (b) a polynucleotide sequence comprising at least one of the following: (1) a polynucleotide coding for at least a functional portion of a polypeptide encoded by a polynucleotide of any one of claims 1 and 2; and (2) a polynucleotide comprising a non-coding region of a polynucleotide of any one of claims 1 and 2; and
 - (c) a gene termination sequence.
- 8. The construct of claim 7, wherein the polynucleotide is in a sense orientation.
- 9. The construct of claim 7, wherein the polynucleotide is in an anti-sense orientation.
- 10. A transgenic plant cell comprising a construct of claim 7.
- 11. A plant comprising a transgenic plant cell according to claim 10, or fruit or seeds or progeny thereof.
- 12. A method for modulating one or more of the lignin composition, fructan composition and tannin composition of a plant, comprising stably incorporating into the genome of the plant at least one polynucleotide of any one of claims 1 and 2.
- 13. The method of claim 12, wherein the plant is selected from the group consisting of grasses.
- 14. The method of claim 13, wherein the plant is selected from the group consisting of: Lolium perenne and Festuca arundinacea.

15. The method of claim 12 comprising stably incorporating into the genome of the plant a construct of claim 7.

- 16. A method for producing a plant having one or more of altered lignin composition, altered fructan composition and altered tannin composition, comprising:
 - (a) transforming a plant cell with a construct of claim 7 to provide a transgenic cell; and
 - (b) cultivating the transgenic cell under conditions conducive to regeneration and mature plant growth.
- 17. A method for modifying the activity of a polypeptide involved in a lignin, fructan or tannin biosynthetic pathway in a plant comprising stably incorporating into the genome of the plant a construct of claim 7.
- 18. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of: SEQ ID NO: 63-124 and 163-190.
- 19. An isolated polypeptide comprising an amino acid sequence selected from the group consisting of:
 - (a) sequences having at least 75% identity to a sequence of SEQ ID NO: 63-124 and 163-190;
 - (b) sequences having at least 90% identity to a sequence of SEQ ID NO: 63-124 and 163-190; and
 - (c) sequences having at least 95% identity to a sequence of SEQ ID NO: 63-124 and 163-190

wherein the polypeptide has substantially the same functional properties as a polypeptide of SEQ ID NO: 63-124 and 163-190.

- 20. An isolated polynucleotide that encodes a polypeptide of claim 18.
- 21. An isolated polypeptide encoded by a polynucleotide of any one of claims 1 and 2.

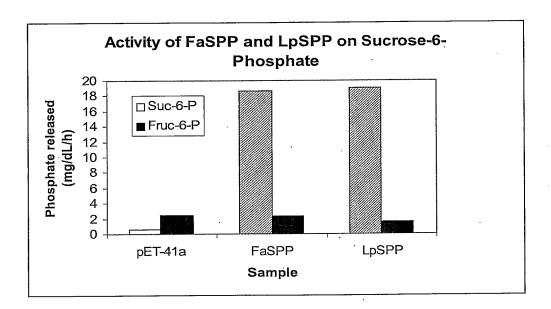


Figure 1.

2/8

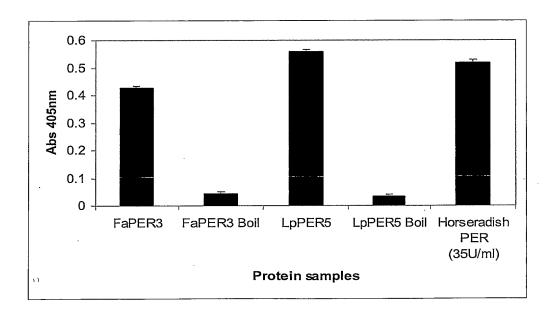


Figure 2.

3/8

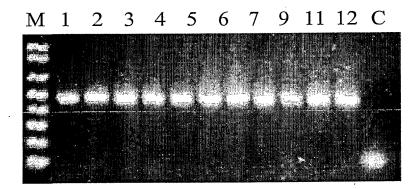


Figure 3.

4/8

M 1 2 3 4 5 6 7 9 11 12 C

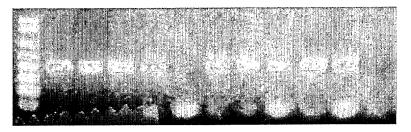
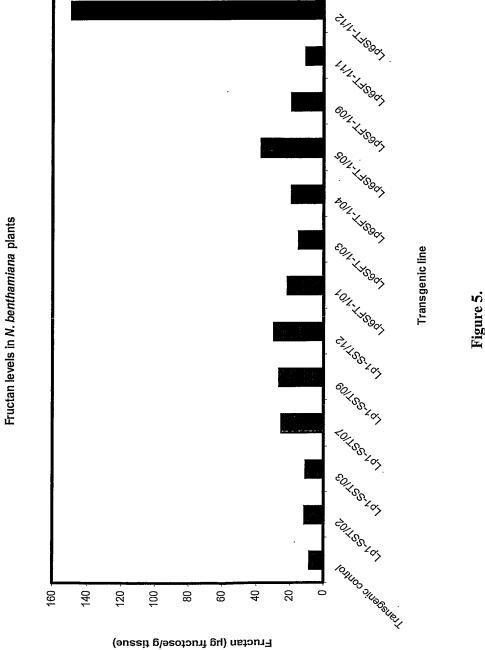


Figure 4.



6/8

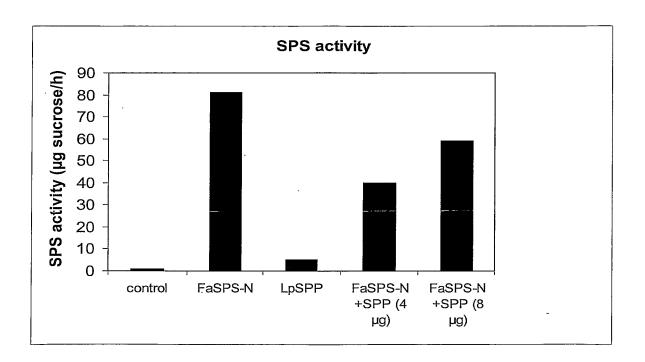


Figure 6.

7/8

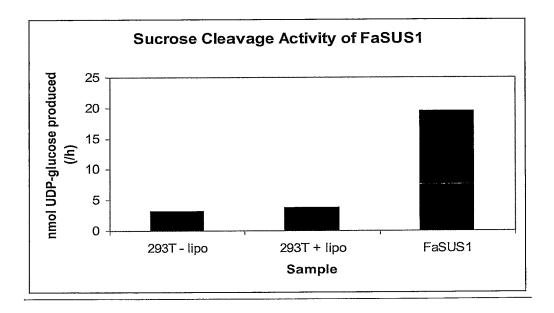


Figure 7.

8/8

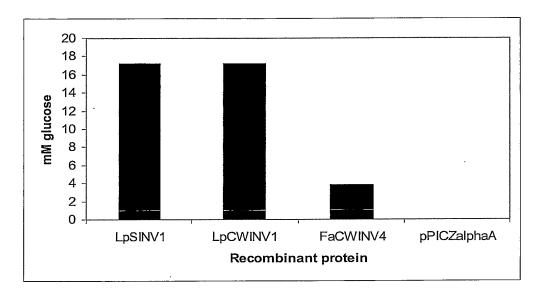


Figure 8.

aaaaaa

2106

SEQUENCE LISTING

<110> Demmer, Jeroen Forster, Richard L Gibson, John Bryan Shenk, Michael Andrew Norriss, Geoffrey Glenn, Matthew Saulsbury, Keith Martin Hall, Claire <120> Compositions isolated from forage grasses and methods for their use <140> <141> 2002-11-07 <160> 218 <170> FastSEQ for Windows Version 4.0 <210> 1 <211> 2106 <212> DNA <213> Lolium perenne 60 gtccagcgcc gtcgtccccg gcaccacggc gccgctgctt ccttatgcgt acgcgccgct 120 gccgtcgtcc tccgacgacg cccgtgaaaa cagaagtagc ggcggcgtga ggtggcgcgc 180 gtgcgccgtc gttctggcgg actcggcgtt ggcggtggtg gtcgtggtcg ggctcctcgc 240 300 gggcggcagg gtggatcggg tcccggccgg cgcagacgtg gcgtcggcca cggtgccggc cgtgccgatg gagttcccga ggagccgggg caaggacttg ggcgtgtcgg agaagtcctc 360 cggtgcctac tccgccgacg gcgggttccc gtggagcaac gccatgctgc agtggcagcg 420 480 caccgggttc catttccagc cggagcagca ctacatgaac gatcccaacg gccccgtgta ctacggcgga tggtaccacc tcttctacca gcacaacccc aagggcgaca gctggggcaa 540 categorigg goccacgory tgtccaagga catggtcaac tggcgccacc tcccgctcgc 600 catggttccc gaccagtggt acgacagcaa cggcgtcctc accggctcca tcaccgtgct 660 ccccgacggc caggtcatcc tgctctacac cggcaacacc gacaccctag cccaggtcca 720 gtgectegec aegecegeeg aecegteega ecegeteete egegaatgga teaageaece 780 cgccaaccc atcetettee egeogeoegg gategggete aaggaettee gegaeceget 840 900 caccgcctgg ttcgaccact ccgaccacac ctggcgcacc gtcatcgggt ccaaggacga cgacggccac gccggcatca tcctcagcta caagaccaag gacttcgtca actacgagct 960 catgcccggg aacatgcacc gcgggcccga cggcaccggc atgtacgagt gcatcgacct 1020 ctaccccgtc ggcggcaact cgtcggagat gctcggcggc gacgactcgc ccgacgtgct 1080 cttcgtgctc aaggagagca gcgatgacga acgtcacgac tactatgcgc tcggaaggtt 1140 1200 cgacgccqtc gccaacgttt ggacgcccat cgaccgggac ctggaccttg ggatcgggct cagatacgac tggggaaagt actacgcctc caagtccttc tacgaccaga agaagaaccg 1260 ccgcatcgta tgggcataca tcggcgagac cgactccgag caggccgaca tcaccaaggg 1320 atgggccaat ctcatgacga ttccaagaac ggtggagctt gacaggaaga cccgcacaaa cctcatccaa tggccagtgg aggaggtcga caccctccgc aggaactcca cggacctcgg 1380 1440 tegeateace gteaacgeeg geteegteat tegeeteece etecaceagg gegeteaact 1500 cgacatcgag gcctccttcc aactcaactc ttccgacgtg gatgctatca acgaggccga 1560 cgtcggctac aactgcagca ccagcggtgc cgccgtacgg ggggcgctcg gcccctttgg 1620 cctcctcgtc cttgccaatg gccgcaccga acagacggct gtgtacttct acgtgtccaa 1680 gggcgtcgac ggcggcctcc agacccactt ttgccacgac gagtcacggt caacacgggc aaaggatgtc gtgaatagga tgattggcag catcgtgccg gtgcttgacg gtgagacctt 1800 ttcggtgagg gtgctagtgg accactccat cgtgcagagc ttcgcgatgg gcgggaggat 1860 cacggcgacg tcgcgggcgt acccgacgga gaccatctac gcggccgcag gggtctacct 1920 cttcaacaac gccacgggcg ccaccgtcac cgccgagagg ctcgtcgtgc acgagatggc 1980 ctcagctgac aaccatatct tcacgaacga cgacttgtag atgaaaccaa gtttagctcg 2040 tgttgcattc ttgttaacgg ccggtgattg cctatctaca cattcatttg gcgttcaaaa 2100

```
<210> 2
<211> 2293
<212> DNA
<213> Festuca arundinacea
<400> 2
60
gcgatggagt ccagcgccgt cgtccccggc accacggcgc ggctgcttcc ttatgcgtac
                                                                     120
                                                                     180
gcgccgctgc cgtcgtccgc cgacgacgcc cgtgaaaacc agggtagcga cggcgtgagg
tggcgcgcgt gcgccgccgt gttggccgcc tcggcgttgg cggtgctggt cgtggtcggg
                                                                     240
                                                                     300
ctcctcgcgg ggggcagggt ggatcggccg ggtccggccg cggtgccggc ggtgccgacg
gagatecega ggageegggg caaggaette ggegtgtegg agaagtegte eggggeetae
                                                                     360
teegeegaeg gegggtteee gtggageaae geeatgetge agtggeageg cacegggtte
                                                                     420
cacttccagc cggagcagca ctacatgaac gatcccaacg gccccgtcta ctacggcgga
                                                                     480
                                                                     540
tggtaccacc tcttctacca gtacaacccc aagggcgaca gctggggcaa catcgcgtgg
gcccacgccg tgtccaagga catggtcaac tggcgccacc tcccgctcgc catggtgccc
                                                                     600
                                                                     660
gaccagtggt atgacagcaa cggcgtcctc accggctcca tcaccgtgct ccccgacggc
                                                                     720
cgggtcatcc tgctctacac cggcaatacc gacaccctgg cccaggtcca gtgcctcgcc
                                                                     780
gagecegeeg accegteega eccaeteete egegaatgga teaageacee ggeeaaceee
atcetettee egeogeoegg gateggeete aaggaettee gegaeeecet cacegaetgg
                                                                     840
                                                                     900
ttcgatcact ccgacgacac ctggcgcact gtcattgggt ccaaggacga cgacggccac
gccggcatca tcctcagcta caagacaaag gacttcgtca actacgagct catgccgggg
                                                                     960
                                                                    1020
aacatgcacc gaggccccga cggcaccggc atgtacgagt gcatcgacct ctacccagtg
                                                                    1080
ggcggcaact cgtcggagat gctcggcggc gacgactcgc ccgacgtgct ctttgtgctc
aaggagagca gcgatgacga gcgtcacgac tactacgcgc tcgggaggtt cgacgccgcc
                                                                    1140
                                                                    1200
gccaacattt ggacacccat cgaccaggag ctggacctcg ggatcgggct caggtacgac
                                                                    1260
tggggaaagt actacgcctc aaagtccttc tacgaccagc ggaagaaccg ccgcgtcgta
tgggcctaca tcggcgagac cgactccgag caggccgaca tcaccaaggg atgggccaat
                                                                    1320
                                                                    1380
ctcatgacga teccaagaac ggtggagett gacaagaaga eeeggacaaa eetcatecaa
tggccagtgg aggaggtcga caccctccgc aggaactcca cggacctcgg tcgcatcacc
                                                                    1440
gtcaacgccg gctccgtcat tcgccttccc ctccaccaag gcgctcaact cgacatcgag
                                                                    1.500
geeteettee ageteaacte tteegaegtg gatgetetea acgaggetga egteggetae
                                                                    1560
aactgcagca ccagcggtgc cgccgtgcgt ggggcgctcg gcccctttgg cctcctcgtc
                                                                    1620
                                                                    1680
cttgccaacg gccgcaccga acagacggct gtgtacttct acgtgtccaa gggcgttgat
ggcgccctcc agacccactt ctgccacgac gagtcacggt cgacgcgggc aaaggatgtt
                                                                     1740
gtgaatagga tgattggcag catcgtgccg gtgcttgacg gtgagacctt ctcggtgagg
                                                                    1800
                                                                    1860
gttctattgg accactccat cgtgcagagc ttcgcgatgg gtgggaggat cacagcgacg
tcgcgggcgt acccgactga ggctatctac gcagcggcgg gggtctacgt cttcaacaac
                                                                     1920
gccacgggtg ccaccgtcac tgccgagagg ctcgtcgtgt acgagatggc ctcggctgac
                                                                     1980
aaccatatct tcaggaacga cgacttgtag atgaaaccaa gtcgagctct tgttgcattc
                                                                     2040
atggtcatcg gtgatcgccc ctgtctacac atccatttgg cattcggtcg gcgggttcct
                                                                     2100
                                                                     2160
cgatcttgtc atggatgggg atcaagatgg agtacaatag ttttcggttt gtttttttgt
atcggtgaga tgaatggaaa ttagatgact gtcctgcccc caagtgcaac tatctgcagg
                                                                     2220
agcacttctg cagtgactat gatgacggtg tcatgtatca actgtaccag atcttttaa
                                                                     2280
                                                                     2293
ttgaaaaaaa aaa
<210> 3
 <211> 2072
<212> DNA
<213> Festuca arundinacea
<400> 3
gcccatccac cggagtatac taggaaattc ctgcaactcg acctcgcgtt gggaattccg
 gcaatggagt cccgggcctt tcccaacgcg gcgtacgcgc cacttctgcc acccaccgct
                                                                      120
gacgacgcca ccctgggcaa gcaggaccgc cccggcgtgg ggtggcgcgg gttcttaacc
                                                                      180
gtgctggccg cgtctggcgt ggtggtgctc ctcgtcgctg ccactatgct cgcgggatcc
                                                                      240
aggatgggtc aggcaggcga caccgacgag gacggggccg gagggttccc gtggagcaac
                                                                      300
 gagatgctgc agtggcagcg cgccgggttc cattaccagc ccgaggggca cttcatgagc
                                                                      360
 gatccagacg gtccggtata ctaccgtgga tattaccacc tcttctttca gtacaaccga
                                                                      420
 aggggcgtcg cgtgggatga ctacatagag tggggccacg tggtgtccca ggacctggta
                                                                      480
 cactggcgcc ctctcccact ggccctgcgg cctgaccatt ggtacgacaa gaagggcgtc
                                                                      540
 ttgtcgggta ccatcacggt gctccacaat ggcacgctcg tcctgctcta cacgggggtc
                                                                      600
 acagaagacc ctatggccga gtctcagtgc atcgccgtcc cgaccgaccc caacgacccc
                                                                      660
 ctccttcgcc attggaccaa gcaccccgcc aaccctgttc tcgctcaccc acagggggtc
                                                                      720
 cagggcatgg acttccgaga ccccaccagt gcatggtttg acaagtccga cgccacgtgg
                                                                      780
```

PCT/NZ02/00239 3

cgcattctca	tcggttccaa	ggatgacgac	aatggaagcc	acgctggcat	cgccttcatc	840
ttcaagacca	aggacttcct	tagcttcgag	cgcgtcccag	gtatcgtgca	tcgtgtcgag	900
		catcgacttt				960
		aaaggcgagc				1020
ttggggagat	atgacgcggc	agccaacaca	tggacgccat	tggacgccga	gctagacttg	1080
gggattgggc	tgagatacga	ctggggcaag	ctctacgctg	ccacgtcgtt	ctacgatccg	1140
		gttggggtat				1200
gttgccaagg	gatgggcctc	acttcagtcg	attccgagga	cagtgacact	agacgagaag	1260
accaggacga	acctcctcct	atggccggtg	gaggaggtgg	aggccctccg	ctacaactcc	1320
accgacctca	gtggcatcac	tgttgacaac	ggctcagtct	tccacctccc	cctccaccaa	1380
gccactcacc	tggacatcga	ggcttccttc	cgcctcgacg	cttctgacgt	tgccgccatc	1440
aacgaggccg	atgtcggcta	taactgcagc	agcagcggtg	gcgcggccgc	acgtggcgct	1500
atcggcccct	tcggcctcct	cgtccatgcc	gccggagacc	tccgtggcga	gcagacggcg	1560
gtgtacttct	acgtgtccag	ggccctcgac	ggtaccctcc	ggactagctt	ctgcaacgac	1620
gagacgcggt	cgtcacgggc	cagggacgtg	acgaagcggg	tggtgggcag	cacggtgccg	1680
gtgctccacg	gtgaggcgtt	gtcgatgagg	gtgctcgtgg	accactccat	cgtgcagagc	1740
ttcgccatgg	gtgggagagt	cacggcgacc	tcgcgggtgt	acccaacgga	ggccatctac	1800
		gttcaacaac				1860
		ctcggcggta				1920
tcgtagctgc	tcacatgagc	tatatatcag	accggtaacg	ttgggtcact	tgcatttcca	1980
		gcttagcaag				2040
		aaaaaaaaa				2072

<210> 4 <211> 2207 <212> DNA

<213> Lolium perenne

<400> 4 qcacccatcc accggaatat atatactagt caggaaattc ctgcaactcg acctcgagtt 60 gggaattccg gcaatggagt cccgggcctt tcccagcgcg gcgtacgcgc cacttctgcc 120 180 atccgccgca gacgacgtcg ccctggccaa gcaggaccgc cccggcgtgg ggtggcgcgg gttcttaacc gtgctggccg cctgcggcgt ggtggtgctc ctcgtcggtg ccactttgct 240 cgcgggatcc aggatgggtc aggcaggcga cggcgaaggc aacaccgacg aggatggggc 300 cggagggttc ccgtggagca acgagatgct gcagtggcag cgcgccgggt tccattacca 360 420 gccggagggg cacttcatga gcgatccaaa cggtccagta tactaccgcg gatattacca 480 cctcttcttt cagtacaacc gaaggggcgt cgcgtgggat gactacatag agtggggcca cgtggtgtcc caggacctgg tacactggcg ccctctccca ctggccatgc ggcctgacca 540 600 ttggtacgac aagaagggcg tcttgtcggg taccatcacg gtgctccaca atggcacgct cgtcctgctc tacacggggg tcacagaaga ccctatggcc gagtcccagt gcatcgccgt 660 720 cccqaccqac cccaacgacc ccctccttcg ccattggacc aagcaccccg ccaaccccgt ccttgctcac ccacaggggg tccagggcat ggacttccga gaccccacca gcgcgtggtg 780 ggacaagtcc gatgccacgt ggcgcattct catcggttcc aaggacgacg acaacggcag 840 ccacqctqqc atcgccttca tcttcaagac taaggacttc cttagcttcg agcgtgtccc 900 aggtatcgtg catcgtgtcg agggcaccgg catgtgggag tgcatcgact tttaccccgt 960 1020 cggaggtggc cacaactctt cgtcggagga gttgtacgtg ataaaggcga gcatggacga cgaacgccac gactactact cattggggag gtacgacgcg gcagcgaaca catggacgcc 1080 attggacgcc gagctagact tggggattgg gctgagatac gactggggca agctctacgc 1140 1200 ttccacgtcg ttctacgatc cggtgaagca gcggcgcatt atgttggggt atgtaggcga ggtcgactct gcgcgagccg atgttgccaa gggatgggcc tcgcttcagt cgattccgag 1260 qacaqtqqcq ctagacgaga agacccgaac gaacctcctc ctatggccgg tggaggaggt 1320 ggaggccctc cgctacaact ccaccgacct cagcggcatc accattgaca acggctccgt 1380 cttccacctc ccactccacc agaccactca gctggacatc gaggettect tecgectcga 1440 cgcttctgat gttgccgcca tcaacgaggc cgacgtcggc tacaactgca gcagcagcgg 1500 cggcgcggcg gcacgtggcg ctctcggccc cttcggcctc ctcgtccatg ccgccggaga 1560 1620 cctccqtqqc qagcagacgg cggtctactt ctacgtgtcc agggccctcg acggtaccct ccggaccagc ttctgcaacg acgagacgcg gtcgtcgcgg gccagggacg tgacgaagcg 1680 1740 ggtggtgggc agcacggtgc cggtgctcga cggcgaggcg ttgtcgatga gagtgctcgt 1800 qqaccactcc atcgtgcaga gcttcgcgat gggcgggagg accacggcga cctcgcgcgt gtacccgacg gaggccatct acgccagggc tggggtgtac ctgttcaaca acgccaccgg 1860 cgccggcgtg acggcggaga ggctcatcgt gcacgagatg gcctcggcgg tatacgacga 1920 gaccetcatg gttgaggact catagetget caccegtaac gttgggtcac ttgcatttee 1980 aagcgttgaa ttaataattt acttgttgta gcagcaagca acggtccaag gttccaagta 2040 aggtgggata ttataccaaa ctccgcaagt cccqcaaggt tgtgtaggtg taagttaatg 2100 ttggcgcacc tgcgcgtgtg catgtaagtt gttgtatttg ttgttctttt aaaaaagaaa 2160 gataccaatc taccatccta tgtaagcata aaaaaaaaa aaaaaaa 2207 <210> 5

```
<211> 2163
<212> DNA
<213> Festuca arundinacea
<400> 5
gaattcctgc aactcgacct cgagttggga attccggcaa tggagtcccg ggcctttccc
                                                                      60
                                                                     120
agegeggegt aegegeeact tetgeeacce acceptgacg aegecaccet gggeaageag
                                                                     180
gaccgccccg gcgtggggtg gcgcgggttc ttaaccgtgc tggccgcgtc tggcgtggtg
gtgctcctcg tcgctgcctc tttgctcgcg gggtccagga tgggtcaggc aggcgacggc
                                                                     240
                                                                     300
gaaggcaaca ccgacgagga cggggccgga gggttcccgt ggagcaacga gatgctgcag
tggcagcgcg ccgggttcca ttaccagccc gaggggcact tcatgagcga tccagacggt
                                                                     360
ccggtatact accgtggata ttaccacctc ttctttcagt acaaccgaag gggcgtcgcg
                                                                     420
                                                                     480
tgggatgact acatagagtg gggccacgtg gtgtcccagg acctggtaca ctggcgccct
ctcccagtgg ccatgcggcc tgaccattgg tacgacaaga agggcgtctt gtcgggtacc
                                                                     540
atcacggtgc tccacaatgg cacgctcgtc ctgctctaca cgggggtcac agaagaccct
                                                                     600
                                                                     660
atggccgagt cccagtgcat cgccgtcccg accgacccca acaaccccct ccttcgccat
tggaccaagc accetgecaa ceetgttete geacacceae agggggteea gggcatggae
                                                                     720
                                                                     780
ttccgagacc ccaccagcgc atggtttgac aagtccgacg cgacgtggcg cattctcatc
ggttccaagg acgacgacaa tggaagccac gctggcatcg ccttcatctt caagaccaag
                                                                     840
gacttcctta gcttcgagcg cgtcccgggt atcgtgcatc gtgtcgaggg taccggtatg
                                                                     900
tgggagtgca tcgactttta ccccgtcgga ggtggccaca actcttcgtc ggaggagctg
                                                                     960
tacgtgataa aggcgagcat ggacgacgaa cgacacgact actactcatt ggggagatat
                                                                    1020
                                                                    1080
gacgcggcag ccaacacatg gacgccattg gacgccgagc tagacttggg gattgggctg
agatacgact ggggcaaget ctacgetgee acgtegttet acgateeget gaageagegg
                                                                    1140
                                                                    1200
cgaattatgt tggggtatgt aggcgagacc gactctgcgc gagccgacgt tgccaaggga
                                                                    1260
tgggcctcac ttcagtcgat tccgaggaca gtgacactag acgagaagac caggacgaac
ctcctcctat ggccggtgga ggaggtcgag gccctccgct acaactccac cgacctcagt
                                                                    1320
                                                                    1380
ggcatcacta ttgacaacgg ctcagtcttc cacctccccc tccaccaagc cactcagctc
gacatcgagg cttccttccg cctcgacgct tctgacgttg ccgccatcaa cgaggccgac
                                                                    1440
gtcggctaca actgcagcag cagcggtggc gcggccgcac gtggcgctat cggccccttc
                                                                    1500
ggcctcctcg tccatgccgc cggagacctc cgtggcgagc agacggcggt gtacttctac
                                                                    1560
gtgtccaggg ccctcgacgg taccctccgg accagettet gcaacgacga gacgeggtcg
                                                                    1620
tcacgggcca gggacgtgac gaagcgggtg gtgggcagca cggtgccggt gctcgacggt
                                                                    1680
                                                                    1740
gaggcgttgt cgatgagggt gctcgtggac cactccatcg tgcagagctt cgccatgggt
1800
gtgtacctgt tcaacaatgc caccggcgcc agcgtgactg ccgagaggct catcgtgcac
                                                                    1860
gagatggcct cggcggtgta cgacgagacc ctcatggttc aggactcata gtttctcaca
                                                                    1920
tgagctatca gactggtaac gttgggtcac ttgcatttcc aagggttaaa taatttactt
                                                                    1980
agcgtagcaa ctggtccgag gttccaagta aggtgggata ttcttccaaa ctccgcgagt
                                                                     2040
cccgtcaggt tgtgttggtg tgagtgtgat gttggcgcac ctgcgcgtgt gcatgtaagt
                                                                     2100
tgttgtattt gttgtttcta tacctaataa taaaggaaaa aggatttctc cctaaaaaaa
                                                                     2160
                                                                     2163
aaa
<210> 6
<211> 2200
<212> DNA
<213> Lolium perenne
agccgaggca cccatccacc ggagtatact agctaggaaa ttcctgtgca actcgacctc
                                                                       60
gagtttggaa ttccggcaat ggagtcccgg gactttccca gcgcggcgta cgcgccactt
                                                                      120
                                                                      180
ctgccatctg ccgcagacga cgtcgccctg gccaagcagg accgcccgg cgtggggtgg
cgcggcttct taaccgtgct ggccgcctgc ggcgtggtgg tgctcctcgt cgctgcctct
                                                                      240
ttgctcgcgg ggtccaggat gggtcaggca ggcgacaccg acgaggacgg ggccggaggg
                                                                      300
ttcccgtgga gcaacgagat gctgcagtgg cagcgcgccg ggttccatta ccagccggag
                                                                      360
gggcacttca tgagcgatcc agacggtccg gtatactacc gtggatatta ccacctcttc
                                                                      420
tttcagtaca accgaagagg ggtcgcgtgg gatgactaca tagagtgggg ccacgtggtg
                                                                      480
tcccaggacc tggtacactg gcgccctctc ccactggcca tgcggcctga ccattggtac
                                                                      540
gacaagaagg gcgtcttgtc gggtaccatc acggtgctcc acaatggcac gctcgtcctt
                                                                      600
ctctacacgg gggtcacaga agaccctatg gccgagtccc agtgcatcgc cgtcccgacc
                                                                      660
gaccccaacg accccttct togccattgg accaagcacc ccgccaaccc cgttctcgct
                                                                      720
cacccacagg gggtccaggg catggacttc cgagacccca ccagegegtg gtgggacaag
                                                                      780
 teggacteca egtggegeat teteateggt tecaaggacg acgacaacgg cagecaeget
                                                                      840
 ggcatcgcct tcatcttcaa gaccaaggac ttccttatct tcgagcgtgt cccaggtatc
                                                                      900
```

		,			
gtgcatcgtg tcgagggtac ggccacaact cttcgtcgga cacgactact actcattggg gccgagctag acttggggat tcgttctacg accactgaa tctgcgcgag ccgacgttgc gcactagacg actccaccga ctccctctcc accaagccac gatgttgctg ccatcaacga gccgctcgtg ggcgagcaga agctctcgg ggcagcaga agctctgca agctctgca agagctccg tcgatcgtc agagctccg acgagcacg tcgatcgtg tccaccagaa acgcaccgg ttcgatcgtc agagctccg acgaggcta agagctccat atggtaagg agagctcat atggtaagg agagctcat atggtaagg agagctcat atggtaagg agagtattct tgtaatgtcg acagaaaaaa <210> 7 <211> 1756 <212> DNA	ggagttgtac gaggtatgac tgggctgagg gcagcggcga caagggatgg gacgaacete cetcagegge tcagetggac gccgtegge tctetaegtg geggtegtea cgaeggegag gatgggtga ggtggagggtg cgtgcacgag getcacacat taatttactt tccaaactce tgegegtgag	gtgataaagg gcggcagcga tacgactggg attatgttgg gcctcacttc ctcctatggc atcactgttg atcgaggctt ggctacaact ctcctcgtcc tccagggccc cgggcccgg gtgttagcga aggttagcga aggttagcga atggcctcgg gagctatcag gagctatcag gagctatcag gcgtagcaa gcgagtcccg cttgtaattt	cgagcatgga acacatggac gcaagctcta ggtatgtagg agtcgattcc cggtggagga agaacggctc ccttccgcct gcagcagcag atgccgccgg tcgacggtag acgtggcgaa tgagggtgct cgacgtcgc acacgccac cggtatacga acggtagcac acggtatacga accggtaacg accggtatacga accggtaacg ccaggttaccg	cgacgaacga gccattggac cgcttccacg cgatgtcgac gaggacagtg ggtggaggcc catcttccac cgatgcttct cggtgcgcg agacctccgt cctcggacc gcgggtggtg cgtggaccac ggtgtaccac ggtgtaccac cgagaccgtc ttgggtcact cgaggttca ttgggtcact aggtgtaacc taggttcact aggtttca taggtttaag	960 1020 1080 1140 1260 1320 1380 1440 1560 1680 1740 1880 1920 1980 2040 2100 2200
<212> DNA <213> Festuca arundina	202				
<213> Festuca arundina	acea				
<400> 7					60
cccatctctc ccgaaacaac ttccccttcc tcttctccc	cgctcgccac	ccgtctccct	cccctgccct	ctccaccaaa	60 120
egegeeteeg gatetegege	accacctcaa	aggggatcct	cccataacca	ccgtcctcct	180
ccgccgctcg gctggactgt	cgtggagcgg	ggatcgaccc	gggctctctg	tegetggttg	240
ctaaaatgga taagctcaat	ggttctgcgc	gtcttatgat	tgtttcagac	ctcgatcata	300
caatggttga tcatcatgac	gaagagaact	tgtcgttgct	taggtttggg	gccctttggg	360
agtctgctta ctgtcaggat	tctctacttg	tcttctcgac	cggaagatca	cccactctct	420
ataaggaatt gaggaaagag	aagcctatgc	taactccaga	catcactatt	atgtcggtgg	480 540
gcagtgagat aacttatggt	gaggccatgg	ttcctgatga	tggctgggag	gaatatetga	600
acaataagtg ggacagaaat ttcagccaga gacagaacag	artgricitg	aggagaccgc	cttaattaac	aagaagagtg	660
ctcaggaagt gataaagtct	ctctctgaga	agtttgagaa	acqtqqqqta	gatgcaaaaa	720
taatctatag tggtggccaa	gaccttgaca	tattagctca	aggggctgga	aagggtcagg	780
cacttacata tttactcaaq	aagttcgcct	catgcgggaa	aacacccaac	aatactcttg	840
tttgtggtga ctctggcaat	gatgcagaat	tattcagcat	ccctggtgtg	cacggtgtca	900
tggttagcaa tgcccaagag	gaactactcc	agtggcatgc	agaaaatgcg	aaggataacc	960 1020
ctaaggtaat tcatgcaact tcaagctagg acctaatatt	gagaggtgtg	acattgagtat	tecttacete	accoggoact	1020
ctttcaagcc tacagcggct	attataaaat	tctatgttct	ctgcgagaag	tggcgtaggg	1140
ctgacgttcc aaaggctgat	tcagttatag	agtacttcaa	aaacatcacg	gatgcaagtg	1200
gagttattat tcatccctct	ggcctcgaac	tttcgatcca	ttcttccatc	gatgcgttgg	1260
cttcatgtta tggtgacaaa	caaqqqaaaa	agtaccgatc	. atgggtggac	agactagtta	1320
tctcacagac tgcttctgac	agttggcttg	tgagatttga	cttgtgggag	gcagaaggtg	1380 1440
atgcatgggt gtgctgtttg gtttcgtggt aacacacatc	acaactcttg	cgctgaalgl	atattcccc	. deceergggg	1500
cqtccaaact ctagactgga	. cacaagacat . tctctaccot	Gaccacacac	gaaggaaatt	ttcttgagaa	1560
tcaaataaga agcgcacaga	aaacacgaga	atttctttc	: cttgttcata	atgttaataa	1620
atactcccag acactacata	ı tatcatactq	gatgaagtat	. acggaggtct	tgatgcttgg	1680
cctaatgctt acttgatgtg	, taagataaaa	atattatatc	: tcgttactgg	catgagaagc	1740
tgaagtaaaa aaaaaa					1756
<210> 8 <211> 1778 <212> DNA <213> Lolium perenne		,			

<400> 8

ggaaccacaa aggcgctcgc	ccatctctcc	teetteega	aacaaccact	caccacccat	60
ctccctccc ctgccctcgc	ctccccattc	ccctccctct	tcttcccttg	gccacggcct	120
cctcgatcgg acccaatctc	caccacacac	gcctccggat	ctcgcgcgcc	gcctccaagg	180
ggatcctccc gtcctcccc	accactcaac	tagaccatca	tcgagcgggg	atcgacccgg	240
gctctccgtc gctggttgct	aaaatggata	agctcaatgg	ttctgcgcgt	ctcatgattg	300
tttcagacct cgaccataca	atggttgatc	accatgacga	agagaacttg	tctctgctta	360
ggtttggggc cctttgggag	tctacttact	gccaggattc	tcttcttgtc	ttctcgaccg	420
gaagatcgcc cactctctat	aaggaattga	qqaaaqaqaa	gcctatgctg	actccagaca	480
tcactattat gtcggtgggc	agtgagatta	cttatggcga	ggccatggtt	cctgatgatg	540
gctgggagga atatctcaac	aataagtggg	acaagagtat	tgttcttgag	gagaccgcta	600
agttttctga gctgaagctt	caggcagaga	cagaacagcg	tccacataag	gtcagcttct	660
tggttgacaa gaagactgct	caggaagtga	tcaagtctct	ctctgaaaag	tttgagaaac	720
gtggggtaga tgcgaaaata	atctatagtg	gtggccaaga	ccttgacata	ttagctcaag	780
gggctggaaa gggtcaggcg	cttgcatatt	tactcaagaa	gttcgcctca	tgcgggaaaa	840
cacccaacaa tactcttgtt	tgcggtgact	ctggcaatga	tgcagaatta	ttcagcatcc	900
ctggtgtgca cggtgtcatg	gttagcaatg	cccaagagga	actactccag	tggcgtgcag	960
aaaatgcgaa ggataaccct	aaggtaattc	atgcaactga	gaggtgtgct	gctggtatta	1020
ttcaagctat cgggcacttc	aagctaggac	ctaatgtttc	tccaagagac	gttgagtttc	1080
cttacgtcaa ggaggactct	ttcaagccta	cagcggctgt	tgtgaagttc	tatgttctct	1140
gcgagaagtg gcgtagggct	gacgttccaa	agactgattc	agttatagag	tacttcaaaa	1200
acatcacgga tgcaagtgga	gttattattc	atccctctgg	ccttgaactt	tcgatccatt	1260
cttccatcga tgcgttggct	tcatgttatg	gtgacaaaca	agggaaaaag	taccgatcat	1320
gggtagacag actagttatc	tcacagactg	cttctgacag	ttggcttgtg	agatttgact	1380
tgtgggaggc agaaggtgat	aagtgggtgt	gctgtttgac	aactcttgcg	ctgaatgtaa	1440
agcctgaaac ccctgggggt	ttcgtggtaa	cacacatcca	caagacatgg	ctcaaagaat	1500
attccqqqqa tqagcaggcg	tccaagctct	agactggatc	tccaccggca	gcgcacggga	1560
aggaaatttt cttgagaatc	aaataagaag	cgcacagaaa	acatgagaat	ttctttttct	1620
tgttcataat gttaataagt	gctcccagac	actacatata	tcatactgga	tgaagtctac	1680
ggaggtcttc ggctaatgct	tacttgatgt	gtaagataaa	aatattatat	cttgttactg	1740
catgagaagc tgaagtaaat	gatcccaaaa	aaaaaaaa			1778
<210> 9					
<211> 3629					
<212> DNA					
<213> Festuca arundina	acea				

<400> 9

agtagcctgc ctgctcgccg gcgagagata gctagggagg gagggtaact agcgcaggag 60 120 . gagectgete geetgeegte gagatggegg eggggaaega gtggateaae gggtaeetgg aggcgatect ggacgeeggg tegaagetge ggeegeaggg egtgeagetg eegeegetgg 180 agacggcgcc ggcgctcgcg gccgaggagt ccggcgccgc ctacaacccc accaggtact 240 tcgtggagga ggtggtcagg agcttcgacg agcaggccct ccacaagaca tggacaaagg 300 tggttgcgat gcggaacagc caggagcgca gcaaccggct ggagaacctg tgctggagga 360 420 tctqqaacgt ctccaggcag aagaagcagg tggagtggga ttacacgaaa gaggtggccc ggcggaagct tgagcaggag ctgggcagcc gggaggccgc cgaggacctc tccgagctct 480 540 ccgagggcga gaaggatacc accaccgcca agcctgacgc cgcaaccgct caaccgtcca 600 ccgacgatgg cgagcaccag cagccacaac cacgcacccg gctcgcgagg atcaactccg aggtgcggct cgtctccgac gacgaggagg agcagaccaa gaagaggaac ctctacatcg 660 720 tcctcatcag catccatggg ctggtgcgcg gggagaacat ggagctcggc cgagactccg acaccggagg ccaggtgaag tacgtggtgg agctggcccg tgcgctggcg gccacggcgg 780 gggtgcaccg cgtggacctg ctgacgcggc agatctcctg ccccgacgtg gactggacct 840 900 acggcgagcc ggtggagatg ctggagcgcc tgtcgtcggc ggacgcggac gaggacgacg gcgagcagtc tggcggcggg gcgtacatcg tgcggctgcc gtgcgggccc agggaccagt 960 1020 acatccccaa ggaggagctg tggccgcaca tcccggagtt cgtggaccgc gcgctctcgc acgtcaccga ggtggcgcgc gcgctaggcg accagctcca gcctcctccc actccggccg 1080 cgggcgacgg cgcagcccta gtggcagcgc ccatatggcc gtacgtgatc cacggccact 1140 1200 acgcggacgc ggcggaggtg gcggcgaacc tggcgagcgc gctgaacgtg cccatggtca tgacgggcca ctcgctgggg cgcaacaagc tggagcagct gctcaagctg ggccgcatgc 1260 cgggccccga gatccagggc acctacaaga tcgcgcgccg gatcgaggcc gaggagaccg 1320 gcctcgacac cgcggagatg gtggtcacca gcaccaagca ggagatcgag gagcagtggg 1380 geotetacga eggettegae etcatggtgg agegeaaget eagggtaagg eagegeegeg 1440 gcgtcagcag cctcggcagg tacatgccgc gcatggcggt catcccgccc ggcatggact 1500 tcagcttcgt cgagacacag gacacggctg agggggatgg cgccgacctg cagatgctca 1560 ttgcccccga caaggccaag aaggctctgc ctcccatttg gtcggacgtg ctgaggttct 1620 tcacgaaccc gcacaagccg atgatectgg egetgtegeg geeggaeceg aagaagaacg 1680 tcactacgct gctcaaggcc tacggcgaga gccgccagct ccgggagctc gcgaacctga 1740

ctttgatact	aaaaaaaaa	gatgacatcg	aggacatggc	caacaacaac	gacacaatac	1800
tcacggcggt	gctcaagctc	atcgaccgat	acgacctcta	cggccaggtg	gcctatccaa	1860
agcaccacaa	gcagacggac	gtgcctcaca	tctaccgcct	cgctgcaaag	accaagggag	1920
tattcaccaa	cccagctctt	gtagagccgt	tcggcctcac	aatcatcgag	gctgctgctt	1980
acggtttgcc	ggtggtcgca	accaagaacg	gagggccggt	ggacatcctc	aaggcgctca	2040
acaacgggct	gctggtggac	ccgcactcgg	cggaggcgat	caccggcgcc	ctgctgagcc	2100
tactaaccaa	gaagtcgcgg	tgggtggagt	gccgccgcaa	cggcctccgc	aacatccacc	2160
gcttctcgtg	gccgcaccac	tgccgcctct	acctctccca	cgtctccacc	tactgcgacc	2220
agccctcgcc	gcaccagcct	ctccgcgtgc	ccctcggcct	gggctcctcg	accagcttcg	2280
gcgcagacga	ctcgctctcg	gactcgctcc	gcggcctctc	gctccagata	tccgtggacg	2340
cctccagcga	cctcaacgcc	gcggactccg	cggccgccat	catggacgcg	ctccgccggc	2400
gcccggcctc	cgagaagccg	gcgagctccg	gtgccagggc	gctcggcttc	gcgcccggcc	2460
ggcgggagag	cctcctggtg	gtcgccgtcg	actgctacgg	cgacgacggc	aagccggacg	2520
tcaagcagct	aaagaaggcc	atcgacgcgg	cggtgtcggt	tggtgaatgc	gcgggagcta	2580
agcaggggta	cgtgctgtcg	accggcatga	ccatccccga	ggccgcggag	gcgatcaagg	2640
cgtgcggcgc	cgacgttgcc	agcttcgacg	cgctgatatg	cagcagcggg	gccgagctat	2700
gctacccgtg	gaaggagctc	gcggccgacg	aggagtactc	cgggcacgtc	gcgttccggt	2760
ggcccggtga	ccacgtgaaa	tccgccgtgc	ccaggctcgg	gagcttggag	gagatcgccc	2820
tcgcaatcga	tcgccccgcc	tgctccgtgc	actgccacgc	ctacgccgcc	acggacgcat	2880
ccaaggtgaa	gaaggtggat	tcgatcagga	agtcgctgcg	gatgcgcggg	ttccggtgca	2940
acctcgtcta	cacgcgcgcg	tgcacgcgcc	tcaacgtcat	cccctctcc	gcttcccggc	3000
cgcgcgctct	caggtacctg	tcgatacagt	gggggatcga	tctctccaag	gtggcggtgc	3060
tcgtcggcga	gaccggcgac	accgaccgcg	agaggctcct	cccgggagtt	cacaagacgc	3120
tcatcctgcc	gggaatggtc	gcccgcggca	gcgaggagct	cctccgaggc	gacgacgggt	3180
acaccatggc	ggacgtcgtg	gccatggact	ccccaacat	tgtcacgctc	gccgaaggcc	3240
agtctgcctc	cgacctcctc	aaggccatct	gagagcgtgc	tctgctgctc	cctgtgctgc	3300
ttctgttttc	cacatctggg	acgcagtagc	ttcacttgga	ttgtttcgcc	tgtgattttg	3360
gcaggaagat	gatgactgca	gaattgcatt	tgcatatacc	gtatacctgt	gcaagcatga	3420
gcaaaacatg	tcagctaata	attctttaat	gttttggtca	tgcctccgtg	aggtatgctt	3480
gtgtgcattc	tataaaagaa	aaacgcaaga	atgaaagaaa	gaaatatttt	caatgtaagt	3540
tgatgtttct	tcctgacggc	ttcttacttg	gattgtctac	attaattgtt	tcaaggaaat	3600
acaaggatct	cccctctcca	aaaaaaaa				3629
.040. 40						
<210> 10						
<211> 3745						
<212> DNA						

<213> Lolium perenne

<400> 10

getecgatee eccaeceace teccaattte eccaageege ategeateae etegteteee 60 gagagcaccg cgatggcggg gaacgactgg atcaacagct acctggaggc catcctcgac 120 180 gcgggcggca ccgcggggga catctcggcc gcctctgtgg ccggaggcga tgatgggccg ggcgctggcg gaggcactgc gggggagaag cgggacaagt cgtcactcat gctccgagag 240 cgcggccggt tcaaccccgc gcgctacttc gtcgaggagg tcatctccgg attcgacgag 300 360 acggacetet acaagacetg ggteegeacg teggeeatga gaageeegea agagaggaat acgcggctgg agaacatgtc ctggaggatc tggaacctcg ctaggaagaa gaagcagatt 420 480 qaaqqtqaqq aagcctcccq tttatcaaag aaacgtcttg aacgtgagaa ggctcgtcga gatgctgctg ctgatttgtc tgaggaccta tctgagggag aaaaaggaga aaacattaac 540 ggatcatctg ttcacgatga gagcacaagg ggacgaatgc caaggatagg ttcaactgat 600 660 gctattgagg tgtgggcaaa tcagcacaaa gataaaaaac tgtacatagt gctaataagt attcatggtc ttatacgtgg tgagaatatg gagcttgggc gtgattcaga tacaggcggt 720 caggicaaat atgitgtaga gcttgctagg gcattaggig aaacacctgg agiatacaga 780 gtggatctgc tgacaaggca gatttctgca cctgatgttg actggagtta cggagaacct 840 900 acagagatgc tgagtccaag aaattctgag aaccttgggg atgacatggg tgaaagcagt 960 ggtgcttata ttgttaggat accttttgga ccaagagaaa agtatatacc taaagagcag ctctggcccc acatacagga atttgttgat ggtgcacttg tccatatcat gcagatgtcc 1020 aaggttcttg gtgaacaagt tggtcgtgaa cggcgagtat ggcctgttgt tatccacgga 1080 cactatgctg atgcaggcga ttctgctgct ctattatctg gggcactcaa tgtcccaatg 1140 gtattcacag gtcattctct tggcagagac aaattagagc aacttttgaa gcaaggacgt 1200 caaaccaqqq acqaaqtaaa tqcaacatac aagataatgc gtcggattga agctgaggaa 1260 ctttgtcttg atgcatctga aattgtaatt acaagcacta ggcaagaaat agagaaacaa 1320 tggggattgt acaatggatt tgatgtaact atggagagga aacttagagc aagaacaaag 1380 cgtggtgtca gctgctatgg tcgttacatg cctcgtatga ttgcgattcc tcctggcatg 1440 gagtttagcc atattgtgcc tcatgatgtt gacctggatg gtgatgaagc aaatgaagtt 1500 ggctcaggtt caccggatcc acctatttgg gctgatataa tgcgtttctt ctcaaaccct 1560 cgtaagccca tgattctcgc tcttgctcgg ccagatccca agaagaacat cactacattg 1620

atasagacat	ttaataaaca	ccctggattg	agaaatttag	caaaccttac	actgatcatg	1680
gegaaggeat	atattatta	traaatrica	agcacaaatg	gagetgtttt	gacctcagta	1740
ggcaaccgcg	ttgccaccga	tastatatat	ggccaagtgg	cataccccaa	gcaccataag	1800
Cicaayitaa	ttyacaaata	tyatteatat	gcggcaagaa	cacaccccaa	++++=++==+	1860
caatctgaag	ttccagatat	ttatogittg	geggeaagaa	caaagggggt	tectaticati	1920
tgtgcttata	ttgaaccatt	tgggctcacc	ttgatcgagg	etgetgetta	rggreraceg	
atggttgcta	cccaaaatgg	tgggcctgtc	gacatacacc	gggttcttga	caatggtatc	1980
cttgttgatc	cacacaacca	aaatgatatt	gctgaggcac	tttataagct	tgtttctgat	2040
aagcacttgt	gggcacaatg	ccgtcagaat	ggtctggata	atatccatcg	attttcttgg	2100
cctgaacatt	gcaagaacta	tttatcacaa	gttggcacgg	tgaagcctag	acatccacga	2160
taacaaaaaa	ataataatac	tactgaagtt	tctgaatcag	attcacctgg	caattetta	2220
aggeatagga	atratatato	tettaaette	aagctttcct	tagacagtaa	aaaaacaaac	2280
agggatgttt	atgatatate	coctaacecg	aatgccagaa	casatatta	acatactata	2340
accaagataa	atactgaacg	adallecace	aatyccayaa	yaaatettya	ggatgetgta	2400
ctaaaatttt	caaatgctgt	tagtgagggc	acaaaggatg	agtetgatga	gaargergag	
gccaccacag	gctccataaa	tggccatctt	tacggagaga	aacacattgt	tgttattgct	2460
gtagattctg	tgcaaaatgc	tgacttggtt	cagattatca	aaaacctttt	tgaggcttca	2520
cqcaaaqaaa	aatcatctgg	tgctgttggt	tttgtactgt	cgacatctcg	agcaatatca	2580
gagacactta	cttttttaac	atctgggggc	atacaaacta	ctgaatttga	tgccttcata	2640
tacaacaata	gcagtgatct	ttottatcca	tcttcaagtt	cggaagacat	gcttagccct	2700
aggaggagtg	catttatcat	tratcttrat	tatcactctc	agattgaata	ccattagaga	2760
accyagette	tacccacgac	agatottgat	tgggcagcag	agaccgaaca	tcacactcca	2820
ggggaaggii	Laaggaagac	actaattcgt	tgggcagcag	addacaacag	etttesset«	2880
caagaagtag	ttactgaaga	tgaagaatgt	tcatccactt	actgcatttc	attladagig	
aagaatactg	aggctgtccc	tcctgtgaag	gatcttagaa	aaacaatgag	aattcaagca	2940
ctgcggtgtc	atgtattgta	cagccatgat	ggtagcaagt	tgaatcttat	acctcttcta	3000
gcatcacgat	cccaagcact	aaggtacttg	tatatacgat	ggggggtaga	gctggcaaac	3060
atgacagtgg	ttgttggtga	aagtggtgat	acagattatg	aagggctact	tggaggcgtg	3120
сасаадасса	tcatactcaa	aggeteattt	aatgctgctc	caaaccagct	tcatgctgcc	3180
agaagaaca	cactagaga	tatcatatca	tttgacaaac	caggaattgc	ttcagtcgag	3240
agaagccacc	caccygagga	anatagast	ctacaacagt	tcaatatact	gaactaaagt	3300
ggatatetee	Cagatagett	aaaattagtt	t	attatatata	gaaccaaagc	3360
gacaatcttg	ccatcagcag	aacagttaag	tagagtatct	accolatyty	giccagaicg	
agaaatgtgc	agcaaggctt	gtcttcgctg	ttttaccacg	tcttgcatgg	cagaataagt	3420
tctggttgag	gtttaccttc	tacaactctt	cttgtaaacc	aaaagaattt	ggagctacga	3480
acttggatca	gttttttgtc	caaggcaaaa	ctcaaggcaa	taatactgtg	ccctaccatc	3540
	-			1 1 1 - 4-4-4-		3600
agtcacaata	aagcaagatt	gaacatcctt	cttgagattc	gttaatgttt	tgtaagacta	3000
agtcacaata	aagcaagatt	gaacatcctt	tcatgcattg	tattatttat	tatcttgtaa	3660
gtcatagtgg	ggagtaattt	atatgttgtt	tcatgcattg	tattatttat	tatcttgtaa	3660
gtcatagtgg acccattttg	ggagtaattt ttttggtgtg	atatgttgtt tgtgatgtta	tcatgcattc tcatgcattg ttatggtaac	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg	ggagtaattt	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660
gtcatagtgg acccattttg tatatttctt	ggagtaattt ttttggtgtg	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatattctt <210> 11	ggagtaattt ttttggtgtg	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatatttctt	ggagtaattt ttttggtgtg	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatattctt <210> 11	ggagtaattt ttttggtgtg	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735	ggagtaattt ttttggtgtg cactcaaaaa	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA	ggagtaattt ttttggtgtg cactcaaaaa	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli	ggagtaattt ttttggtgtg cactcaaaaa	atatgttgtt tgtgatgtta	tcatgcattg	tattatttat	tatcttgtaa	3660 3720
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11	ggagtaattt ttttggtgtg cactcaaaaa um perenne	atatgttgtt tgtgatgtta aaaaa	tcatgcattg ttatggtaac	tattatttat atagctagtt	tatcttgtaa accccctat	3660 3720 3745
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat	atatgttgtt tgtgatgtta aaaaa atagcccgat	tcatgcattg ttatggtaac	tattatttat atagctagtt ttgggatctt	tatcttgtaa accccctat	3660 3720 3745
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcqaggg	tcatgcattg ttatggtaac taatggtaac caatatcaag taattagagc	tattatttat atagctagtt ttgggatctt aagaggagtc	tacctgtaa accccctat tagcgccgga tgctcgccgt	3660 3720 3745 60 120
gtcatagtgg acccattttg tatattett <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga	tcatgcattg ttatggtaac taatatcaag taattagagc tcaacgggta	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg	3660 3720 3745 60 120 180
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cgggtcgaa	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgcc	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca	tagcgccgga tgctcgccgt atcctggacg gcgccggcgc	3660 3720 3745 60 120 180 240
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cgggtcgaa tcgcggccga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccgcctaca	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg	tacctgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg	3660 3720 3745 60 120 180 240 300
gtcatagtgg acccattttg tatattectt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cgggtcgaa tcgcggccga tcaggagctta	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcgcgggg gctgcggccg gctgcggccg gcagagcagc	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccgcctaca gccctccaca	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt	tacctgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga	3660 3720 3745 60 120 180 240 300 360
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagccagga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg gcagagcagc cgacgagcag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gcgcctaca gcctccaca cggctggaga	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg	tagcgccgga tgctcgccgt atcctggacg gcgccggcgcgaggaggaggaggaggaggagaaacgtctcca	3660 3720 3745 60 120 180 240 300
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagccagga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg gcagagcagc cgacgagcag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gcgcctaca gcctccaca cggctggaga	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg	tagcgccgga tgctcgccgt atcctggacg gcgccggcgcgaggaggaggaggaggaggagaaacgtctcca	3660 3720 3745 60 120 180 240 300 360
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcagga ggcagaagaa	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctgc ggcggcggg gctgcggcgg gctgcggccg gcagagcagc ggagagcagc gcgaggagcaac gcaggtggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gcgcctaca gcctccaca cggctggaga tgggattaca	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg cgaaagaggt	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg ggctcggcgg	tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga aacgtctcca aagcttgagc	3660 3720 3745 60 120 180 240 300 360 420
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctgaa tcaggagctt acagcaggag ggcagaagaa aggagctgga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcggagcaac gcaggtggag cagccgggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg acgagtgga cagggcgtgc gccgcctaca gcctccaca cggctggaga tgggattaca gccgccgagg	tcatgcattg ttatggtaac caatatcaag taattagagc tcaacgggta agctgccgccag agacatggac acctgtgctg cgaaagaggt acctatccga	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg ggctcggcgg gctccccgag	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga aacgtctcca aagcttgagc ggcgagaagg	3660 3720 3745 60 120 180 240 300 360 420 480 540
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctgaa tcaggagctt acagcagga gcagaagaa aggagctgga acaccaccac	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcagc gcaggtggag cgacggtgag cagccgggag cagccgggag cagccgggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg acgagtgga cagggcgtgc gccgcctaca gcctccaca cggctgaga tgggattaca gcgccgagg gacgccgagg	caatatcaag taattagagc taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgctcaacc	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg ggctcgcgg gctcccgag gtccgccgac	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga aacgtctcca aagcttgagc ggcgagaaagg gatgcgaga	3660 3720 3745 60 120 180 240 300 360 420 480 540 600
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcaggag gcagaagaa aggagctgga acagcacacacacacacacacacacacacacacaca	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcagc cgacgagcagc gcaggtggag cgcaggtgag cagccgggag cagccgggag cgcaagccc gcagccacgc	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg acgagtgga cagggcttgc gccctccaca gccctccaca gccctccaca gcgctggaga tgggattaca gcgccgagg gacgccgcag acccgcccaga	caatatcaag taatagggta caatatagagc taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgctcaacc cgaggatcaa	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg ggctcgcgag gctcccgag gtccgccgac ctccgaggtg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga aacgtctcca aagcttgagc ggcgagaaagg gatggcgac cggctcgtct	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagga gcagaagaa aggagctgga aggagctgga acaccaccac accagcagcc ccgacgacga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcggagcaac gcaggtggag cagccgggag cgcaagccc gcagccagcg ggaggagcac	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctccaca cggctggaga tgggattaca gccgccgagg acgccgcaga gacgccgcaga gacgccgcaga acccggctcg accaagaaga	caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgaggatcaac ggaacctata	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggt gagatctgg ggctcgcgag gctctccgag gtccgccgac ctccgaggtg catcgtcctc	tagcgccgga tagctcgccgt atcctggacg gcgccggcgcgagaggtgg gcgatgcga aacgtctca aagcttgagc ggcgagaagg gcgagaagg cggcgagaagc cggctcgtct atcagcatcc	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660 720
gtcatagtgg acccattttg tatattctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagcag gcagaagaa aggagctgga acaccaccac accagcagca atgggctggt	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcggagcaac gcaggtgag cgccaagccc gcagccacgc ggaggagcag ggcgggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg acgagtgga cagggcgtgc gccctcaca gccttcaca gcgctggaga tgggattaca gccgccgagg accgcgcagg acccgccgaga accagaaga acatggagc	caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgetcaacc cgaggatcaa ggacctcta tcggccgaga	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggt gaggatctgg ggctcgcgag gctctccgag gtccgccgac ctccgaggtg catcgtcctc	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgcgagaggtgg gcgattccca aagcttcaa aagcttgagc ggcgagaaagg gatggcgagc cggctcgtct atcagcatcc ggtggccagg	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660 720 780
gtcatagtgg acccattttg tatattett <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagga gcagaagaa aggagctgga acaccaccac accagcagca atgggctggt tgaagtacgt	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggcag gcgagcagc cgacgagcag cgacgagcag cgcagggag cgccagcggag cgccagccg ggaggagcac gcagcagcag gggagagcac	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg acgagtgga cagggcgtgc gccctcaca gccctcaca cggctggaga tgggattaca gccgccgagg gacgccgcag gacgccgcag accagaga accaggaga acatggagc gcgcgtgcg	caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgetcaacc cgaggatcaa ggagactcta tcggccgaga tggcggcgac	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgggg gctcgcgag gctcgcgag gctcgcgag gctcgcgac ctccgaggtg catcgtcctc ggggggggtg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcga aacgtctcca aagcttgagc ggcgagagagc ggcgagagagc ggcgagagagc cggctcgtct atcagcatcc ggtggccagg caccgggtgg	3660 3720 3745 60 120 180 240 300 360 420 480 540 660 720 780 840
gtcatagtgg acccattttg tatattett <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagag gcagaagaa aggagctgga acaccacac accagcagcc ccgacgacgc atgggctggt tgaagtacgt acgctgct acagcacac	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcgagcaac gcagctggag cgccagccc gcagccagcc ggaggagcac gcagcaggag cgccagcc gcagcaggag cgcaggag cgcaggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctcaca cggctggaga tgggattaca gccgccgagg gacgccgcag accagagg acccggctgcgcag accagagag accagagag cccggctcgaga ccagagagacccgccgccgccgccgccgccgccgcc	caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgetcaacc cgaggatcaa tcggcgaga tggcggcgac	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg gctcgcgag gctctccgag gctcgcaga ctccgaggtc ctcgaggtg catcgtctc gggggggtg gacctacgg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatggcgagag gatggcgag gatggcagg gatggcgag gatggcgag gatggcagg gatggcagg gatggcagg gatcgcagg	3660 3720 3745 60 120 180 240 300 360 420 480 600 660 720 780 840 900
gtcatagtgg acccattttg tatattett <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagag gcagaagaa aggagctgga acaccacac accagcagcc ccgacgacgc atgggctggt tgaagtacgt acgctgct acagcacac	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcgagcaac gcagctggag cgccagccc gcagccagcc ggaggagcac gcagcaggag cgccagcc gcagcaggag cgcaggag cgcaggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctcaca cggctggaga tgggattaca gccgccgagg gacgccgcag accagagg acccggctgcgcag accagagag accagagag cccggctcgaga ccagagagacccgccgccgccgccgccgccgccgcc	caatatcaag taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgetcaacc cgaggatcaa tcggcgaga tggcggcgac	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg gctcgcgag gctcccgag gctcgcgac ctccgaggtg catcgtcctc ggcgggggtg gacctacgg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatggcgagag gatggcgag gatggcagg gatggcgag gatggcgag gatggcagg gatggcagg gatggcagg gatcgcagg	3660 3720 3745 60 120 180 240 300 360 420 480 540 660 720 780 840
gtcatagtgg acccattttg tatattett <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcaggagctt acagcagga gcagaagaa aggagctgga acaccac accagcagca atgggtcga atgggtcgaa aggagctggg acaccacac accagcagca acgacgacga atgggctggt tgaagtacgt acctgctgac agatgctgga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcgagcagcag cgcaggcag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctccaca cggctggaga tgggattaca gccgccgag gacgccgcag acccggctcg accaagaaga acatggagc gcgctgcgc tcctgcccgg tcggcggag	caatatcaag taattagagc taattagagc tcaacgggta agctgccgcc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgctcaacc cgaggatcaa ggaacctcta tcggcgaga tggcggcgac acgtggactg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctgg gctcccag gctcccag gctcccag gctcccag gtccgccac ctccgaggtc catcgtcctc gcgcgggggtg gacctacggc	tagcgccgga tagctcgccgt atcctggacg gcgccggcgcgagaggtgg gcgatgcga aacgtctcca aagcttgagc ggcgagagg gatggcgagagg gatggcgatg gatggcagg gatggcagg gatggcagg gatggcagg caggctcgtct atcagcatcc ggtggccagg caccgggtgg gagcccgtgg caggccgtgg caggccggcg	3660 3720 3745 60 120 180 240 300 360 420 480 600 660 720 780 840 900
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggcga tcagcagcag acagcagcag acaccaccac accagcagca atgggctggt tgaagtacgt tgaagtacgt tgaagtacgt acatgctgga atgggctggt gaagtacgt acatgctgga atgggctggt gaagtcgga atgggctggt acctgctgac agatgctgaa agatgctgga	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcggagcaac gcaggcag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccgctaca gcctccaca cggctggaga tgggattaca gccgccgagg gacgccgcag accaggatga acatggagc tcctgccgg tcggcgtgcg tcggcgtgcg tcggcgtgcg tcggcgtgcg tcggcgtgcg	caatatcaag taattagagc tcaacgggta agetgccgcc accegaccag agacatggcc cgaaagaggt acctatccga ccgetcaacc cgaggatcaa ggaaccteta tcggccgaga tageggcgaga cacgtggactg cgacaagggactg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctgg gctcccag gctcccag gctcccag gctcccag gctcccac cccgaggtc catcgtcatc ctccgacac cccgacac cccgacac cccgacac gcacgcgac ccacgcgac ccacacac gcacgcgac ccacacac gcacgccac ccacacac gcacgcac	tagcgccgga tagctcgccgt atcctggacg gcgccggcgcgagaggtggg gcgatgcgga aacgtctcca aagcttgagc ggcgagaagg gatggcgat cagcatgct catcagcatc atcgcatc atcgcatc acgctcgtc accgggtgg cagccggtgg caccgggtgg caccgggtgg cagcccgagg caccagg	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcaggag gcagaagaa aggagctggg acaccaccac accagcagca atgggctggt tgaagtacgt tgaagtacgt acatgctgga actgctgaa tcgcgcgcaa atgggctggaa agggctggg acaccaccac accagcagca accaccac accagcagca accagcagca atgggctggt tgaagtacgt acctgctgaa gcgtgccta agctgtggccta	ggagtaattt ttttggtgtg cactcaaaaa um perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggccg ggagagcagc cgacgagcag gcgagcagc gcagccagc	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctccaca cggctggaga tgggattaca gccgccgagg gacgccgcag accaggacga acatggagc ccgcgtgcgc tcctgccgcg tcgcgcgc tcgcgcgg	caatatcaag taattagagc tcaacgggta agetgccgcc accegaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgctcaacc cgaggatcaa ggaacctcta tcggccgaga tgcggcgaga acgtggactacagggagacacgtgacgacga acgtggactgacgacgacgacgacgacgacgacgacgacgacgacgacg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtggtt gaggatctggg gctcccgag gctcccagag ccccgaggtc catcgagagt catcgagagt catcgagagt catcgagagt catcgagagt catcgacacc ggcggggggg ccagcacacc ccgacacc ccgacacc ccgacacc ccgacacc ccgacacc ccgacacc ccagcacac	taccttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatgcgac ggcgacagg cagccggtcg cagccggtgg caccgggtgg caccgggtgg cagccgtcg caggccggcg caggccggcg cccaaggagg accgaggtcg	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcagcagcaga ggcagaagaa aggagctggg acaccaccac accagcagca atgggctggt tgaagtacgt tgaagtacgt acatgctgac acgagctgac acgagcga atgggctggt caacacacac accagcagcca accagcagcca accagcagcca accagcagcca accagcagca acggtgctgaa acgtgtgccta agctgtggcccccccccc	ggagtaattt ttttggtgtg cactcaaaaa maxim perenne gcacacgtat agcctgctcg ggcggcgggg gctgcggcgggagcagc cgacgagcag gcggagcaac gcagccaggag cgccaagccc gcagcgaggag ggcggggag ggcggggag ggcggggag gcggcagctg gcgcatcgc gcactgtcg gcgcaggag	atatgttgtt tgtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctcaca cggctggaga tgggattaca gccgccgagg gacgccgcag accagagaga acatggagc ccggctcg ccgcgcgcgc ccgcgcgcgcgcgcgcg	caatatcaag taattagage taattagage tcaacgggta agetgeege accegaccag agacatggac acctgtgetg cgaaagaggt acctatecga cegetcaace cgaggatcaa ggaaceteta teggeegaga tageggegaga acgtggacgaga acgtggacgacgaga acgegacgacga ggecaaggga accgegeet	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctcgag gctcgcgag gctcccagag gcccagagtg catcgagagtg catcgagagtg catcgagagtg catcgagagtg catcgagagtg catcgagagag cagagagag cagagagag ccagagagag ccagagagg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgga aacgtctcca aagcttgagc ggcgagaagg gatggcgac ggctcgtct atcagcatcc ggtggcagc cggtggcagc cagccggtgg caccgggtgg caggccggcg cccaaggagg accgaggtcg gcggtggcgg	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcagcagcaga gcagaagaa aggagctggg acaccaccac accagcagcc ccgacgacga atgggctggt tgaagtacgt tgaagtacgt acagcagca accgcagcc ccgacgacga atgggctgga atgggctgga atgggctgga acccaccac accagcagcc ccgacgacga acctgctgac acctgctgac acctgctgac acctgctgac accaccac accagcagcc ccgcgcgct ccccacctg	ggagtaattt ttttggtgtg cactcaaaaa maperenne gcacacgtat agcctgctcg ggcggcgggg gctgcggcgggagcagc cgacgagcag cgcaggcag cgcaggcag	atatgttgtt tgtgatgtta tagtgatgtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtgc gccctccaca cggctggaga tgggattaca gccgccgagg gacgccgcag accaggaga accaggaga ccaggaga cgcgcgcg	caatatcaag taattagage taattagage tcaacgggta agetgeege accegaccag agacatggac acctgtgetg cgaaagaggt acctatccga cegetcaacc cgaggatcaa ggaacetcta teggeegaga tageggegaca acgtggactga cegacgacga cacagggactga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cegacgacga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggga cecacaggacacacacacacacacacacacacacacacac	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctcgag gctcgcgag gctcccagag gctccccagag gcccacagcac gcagggggggggg	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgttcca aagcttgagc ggcgagaagg gatggcgac ggcgagaagg gatggcgagc cggctcgtct atcagcatcc ggtggccagg caccgggtg caccgggtg cacgaggtcg gcgagagg gcgagagg gagcccgtgg caccaaggagg accgaggtcg gcggtggcga gtggcggcga	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcaggaga gcagaagaa aggagctggg acaccaccac accagcagcc ccgacgacga atgggctggt tgaagtacgt tgaagtacgt acatgctgga actgtggccta actgctgaa agctgtgccta acctgctgac accaccac acagcagcc ccgacgacga atggctctgaa acctgctgac acctgctgac acctgctgac acctgctgac acctgcgct	ggagtaattt ttttggtgtg cactcaaaaa maperenne gcacacgtat agcctgctcg ggcggggg gctgcggcg ggagagcagc cgacgagcag cgcaggcag cgcaggcag	atatgttgtt tgtgatgtta tagtagtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtcgc gccctcaca cggctggaga tgggattaca gccgccgagg gacgccgcag accagagaga accaggctcg accaagaaga aacatggagc tcggcgggcc tcggcgggacg ctgccggg ctgccgg	caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga ccgaccaga ggacctta tcggcgaga tcggcggaca acggggaca acggggaca acgggggaca acggcggaca acggcgcgc ctcttctcc actacgcgga tcatgacgg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctgcgag gctcccagag gtccgcagac ctccgaggtg catcgtcacc gcaggaggag gcaccacc gcaggaggag ccaccacc ggcgacgac ccgcgacgc cgcgacggc cgcgacggc cgcgacggc	tatcttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatggcgac ggcgagaagg gatggcgagc cggctcgtct atcagcatcg gaggccagg caccgggtgg caccgggtgg caccaaggagg accgaggtcg gcggtggcga gtggcgcaaca	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1140 1200 1260
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcaggag acaccaccac accagcagca atgggctggt tgaagtacgt tgaagtacgt acatgctgga actgcgggt acctgctgaa agctgggccga atgggctggt caccaccac accagcagca accaccac accaccac accagcagca accaccac accagcagca accaccac accagcagca accaccac accagcagca acctgctgag acctggcgag acctggcgag acctggagag	ggagtaattt ttttggtgtg cactcaaaaa magcacgtat agcctgctgcg ggcggggg gctgcggcg ggagagcag cgacgagcag cgcaggcag cgcaggcag	atatgttgtt tgtgatgtta tagtagtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtccaca gcctccaca cggctggaga tgggattaca gcgccgcaga acgccgcag accagagaga accagagaga accaggctcg ccggcgctccg ccggcgctccgc tcctgccgg tcctgccgg tcctgccgg ctccagctc atccagcctc atccacgccc gtgccatgg ctcggccgca	caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga cgactcaacc cgaggatcaa ggaacctcta tcggccgaga tgcggggac acgtggactg ccgacgagagacacgcgagaca ggccaaggga acctcttctcc actacgcgga tcatgacggg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctgggg gctcccgag gctcccagg gctcccagg gcccaccc gcggggggg ccaccacc ggcggaggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc	tagcgccgga tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatggcgagc cggctcgtct atcagcagg caccgggtgg caccgggtgg caccgggtgg caccaggagg caccagggtgg cccaaggagg cccaaggagg gcgtggcgg gtggcgga gggcgcaaca ggcacctaca	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660 720 780 900 960 1020 1080 1140 1200 1260 1320
gtcatagtgg acccattttg tatatttctt <210> 11 <211> 3735 <212> DNA <213> Loli <400> 11 gcgcccgtgc ggagcggagt caacaaagat cggggtcgaa tcgcggccga tcaggagctt acagcaggag acaccaccac accagcagca atgggctggt tgaagtacgt tgaagtacgt acatgctgga actgcgggt acctgctgaa agctgggccga atgggctggt caccaccac accagcagca accaccac accaccac accagcagca accaccac accagcagca accaccac accagcagca accaccac accagcagca acctgctgag acctggcgag acctggcgag acctggagag	ggagtaattt ttttggtgtg cactcaaaaa magcacgtat agcctgctgcg ggcggggg gctgcggcg ggagagcag cgacgagcag cgcaggcag cgcaggcag	atatgttgtt tgtgatgtta tagtagtta aaaaa atagcccgat ccggcgaggg aacgagtgga cagggcgtccaca gcctccaca cggctggaga tgggattaca gcgccgcaga acgccgcag accagagaga accagagaga accaggctcg ccggcgctccg ccggcgctccgc tcctgccgg tcctgccgg tcctgccgg ctccagctc atccagcctc atccacgccc gtgccatgg ctcggccgca	caatatcaag taattagagc tcaacgggta agctgccgc acccgaccag agacatggac acctgtgctg cgaaagaggt acctatccga cgactcaacc cgaggatcaa ggaacctcta tcggccgaga tgcggggac acgtggactg ccgacgagagacacgcgagaca ggccaaggga acctcttctcc actacgcgga tcatgacggg	tattattat atagctagtt ttgggatctt aagaggagtc cctagaggcg gctggagaca gtacttcgtg aaaggtgtt gaggatctgggg gctcccgag gctcccagg gctcccagg gcccaccc gcggggggg ccaccacc ggcggaggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc cgcgacggc	taccttgtaa accccctat tagcgccgga tgctcgccgt atcctggacg gcgccggcgc gaggaggtgg gcgatgcgaa aacgtctcca aagcttgagc ggcgagaagg gatggcgac ggcgagaagg gatggcgagc cggctcgtct atcagcatcg gaggccagg caccgggtgg caccgggtgg caccaaggagg accgaggtcg gcggtggcga gtggcgcaaca	3660 3720 3745 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1140 1200 1260

ccagcaccaa	gcaggagatc	gaggagcagt	ggggactcta	cgacggcttc	gacctcatgg	1440
tggagcgcaa	gctccgggta	aggcagcgcc	gcggcgtcag	cagcctcgga	cggtacatgc	1500
cgcgcatggc	ggtcatcccg	cccggcatgg	acttcagctt	cgtcgagaca	caggacacgg	1560
ctgacgggac	gggccgatct	cagatgctca	ttgctcccga	caaggccaag	aaggctctgc	1620
ctcccatttq	gtcagacgtg	ctgcggttct	tcacgaaccc	gcacaagccg	atgatcctgg	1680
cactatcaca	gccggaccca	aagaagaatg	tcaccacgct	gctcaaggcc	tacggcgaga	1740
gccgccagct	ccgggagctc	gcgaacctga	cactgatact	ggggaacagg	gatgacatcg	1800
aggacatggc	cggtggcggc	ggcgcggtgc	tcacggccgt	gctcaagctc	atcgaccgat	1860
acgacctcta	cggccaggtg	gcctacccaa	agcaccacaa	gcagacggac	gtgcctcaca	1920
tctaccgcct	cgccgccaag	accaagggag	tattcatcaa	cccagctctt	gtggagccgt	1980
tcggcctcac	aatcatcgag	gctgctgctt.	atggtttgcc	ggtggtggcg	accaagaacg	2040
acagaccaat	ggacatcctg	aaggcgctcc	acaacgggct	gctggtggac	ccgcactcgg	2100
cggaagcgat	caccqqcqcq	ctgctgagcc	tgctggctga	gaagtcgcgg	tgggtggagt	2160
gccgccgcaa	cggcctccgc	aacatccacc	gcttctcgtg	gccgcaccac	tgccgcctct	2220
acctctccca	cgtctccacc	tactgcgacc	agccctcgcc	gcaccagccg	ctccgcgtgc	2280
ccctcgccct	gggctcctcc	accagcttcg	gcgccgacga	ctcgctctcg	gactcgctcc	2340
gcggcctctc	gctccagata	tccgtggacg	cctccagcga	cctcaacgcc	gcggactccg	2400
cggccgccat	catggacgcg	ctccgccggc	gcccggcatc	cgagaagccg	gcgagctccg	2460
gtgccagggc	gctcggcttc	gcgcccggcc	ggcgggagag	cctcctggtg	gtggccgtcg	2520
actgctacgg	cgacgacggc	aagcccgacg	tcgagcagct	gaagaaggcc	atcgacgcgg	2580
cggtgtcggt	tggtgaatgc	gcgggagcga	agcaggggta	cgtgctgtcg	accggcatga	2640
ccatccccga	ggccgcggag	gcgatcaagg	catgcggcgc	cgacgttgcc	agcttcgacg	2700
cgctgatatg	cagcagcggg	gccgagctat	gctacccgtg	gaagaagctc	gtggccgacg	2760
aggagtactc	cgggcacgtc	gcgttccggt	ggcccggtga	ccacgtgaaa	teegeegtge	2820
ccaggctcgg	gagcatggag	gagatcgccc	tcgcaatcga	tcggcccgcc	tectecgtge	2880
actgccacgc	ctacgccgcc	acggacgcat	ccaaggtaag	cataacagag	cactacttgt	2940
agtaaccact	aaccagcacg	gtacatggtc	tcctccatgc	ctaagcttct	gatgcgtggg	3000
attttgggca	ggtgaagaag	gtggattcga	tcaggcaggc	gctgcggatg	cgcggcttcc	3060
ggtgcaacct	cgtctacacg	cgcgcctgca	cgcgcctcaa	cgtcatcccc	ctctccgctt	3120
cccaaccaca	cgctctcagg	tacctgtcga	tacagtgggg	gatcgatctc	tccaaggtgg	3180
cagtactcat	cggcgagacc	ggcgacaccg	accgcgagag	gctcctcccg	ggagtgcaca	3240
ggacgctcat	cctgccgggg	atggtcgccc	gcggcagcga	ggagctcctc	cgaggcgacg	3300
acgggtacac	catggcggac	gtcgtggcca	tggactcccc	caacattgtc	acgctcgcgg	3360
aaggccagtc	tgcatccgac	atcctcaagg	ccatctgaga	gcatgctctg	ctccttgtgc	3420
tgcctctgtt	ttccacatcc	cggacgcagt	agctccactt	cgattatttc	acctgtgatt	3480
ttggcaggaa	gatgactgca	gaattgcatt	tgcatatacc	gtatacctgt	gcaagcatga	3540
gcaaaacatg	tcagctaata	attcttttat	gttttggcca	tgcctccgtg	aggtatgctt	3600
gtgtacatac	tataaaggaa	cagagagaga	aacgcaagaa	tgaaagagag	aaatattttc	3660
aatgtaagtt	gatgtttctt	cctgacggct	tcttacaatg	gcttgtctac	attaattgtc	3720
tcaagaaaaa						3735
-						

<210> 12 <211> 2716 <212> DNA

<213> Lolium perenne

<400> 12			+ + + - + + +	~~~~~	+accasacta	60
gcttctcccc	tcacacgcct	cgccatttgt	tttgtgtcct ggtgccacct	tetecteeca	tcctaacgag	120
actegeetee	tottttcasa	ggagegeeee	cagggcaaag	gaatgettea	acaccaccaa	180
atactacta	artttgaage	cttatttaaa	gctgacaagg	agagatatgc	accctttqaa	240
gacattctcc	atactactca	ggaagcaatt	gtgctgcccc	catgggttgc	actggccatc	300
addcctaddc	ctaatatcta	ggactacata	cgggtgaatg	ttagcgagtt	ggctgttgag	360
gagetgagag	tttccgagta	cctggcattc	aaggaacagc	ttgttgatga	gcacgccagc	420
agcaagtttg	tacttaaact	tgattttgag	cctttcaatg	cctccttccc	acgtccttcc	480
atotccaaot	ccattggaaa	tggggtgcag	ttccttaacc	gtcacctgtc	ttccaagctg	540
ttccaggaca	aggagagcct	ctacccacta	ctgaacttcc	tgaaagccca	taaccaccag	600
ggcacgacaa	tgatgctaaa	cgaccgaatt	cagageette	gtgggctcca	atcagccctt	660
agaaaggcag	aagagtatct	aacgagcatt	cctgaagaca	ccccgtcctc	tgagttcaac	720
cacaggttcc	aagagcttgg	cttggagaag	ggttggggcg	acaccgctaa	gcgtgtacag	780
gacaccatcc	acttacttct	tgatctactt	gaggcccctg	atccagccag	cttggagaag	840
ttccttggaa	ctataccaat	gatgttcaat	gttgttatcc	tgtctccaca	cggatatttt	900
gctcaatcca	atgtgttggg	ataccctgat	actggtggcc	aggttgtgta	catcttggat	960
caagtccgtg	ctttggagaa	tgagatgctt	ctgaggatta	agcagcaagg	ccttgacata	1020
acccctaaga	tcctcattgt	caccaggctg	ttgcctgatg	ctgttggaac	tacatgtggc	1080
cagcggctgg	agaaagttat	tgggactgag	cacactgaca	ttctccgtgt	tccattcaga	1140
actgagaagg	ggatcctccg	taagtggatc	tctcgttttg	atgtctggcc	atacctggag	1200 1260
acatacaccg	aggatgttgc	aaacgaactc	atgagagaaa	tgcagaccaa	geetgatete	1320
attattggca	actacagtga	cggtaacctt	gtcgccactc	tgcttgcgca	taagttggga	1380
gttacccagt	gcaccattgc	ccatgctttg	gagaaaacaa	aataccccaa	tanaattatt	1440
tatttggaca	aattcgacag	ccaataccat	ttctcatgcc	agricatige	tagaectiati	1500
gccatgaatc	acactgattt	catcatcacc	agcacattcc gctttcaccc	tacatastat	ctaccatatt	1560
gacagcgtgg	gccagtatga	gteteacatt	ttcaacattg	teteteetaa	agcagatatg	1620
gtccatggga	trgacgrgrr	tanactas	aagaggctta	ctaccttcca	ccctgaaatt	1680
actgtctact	tttagagtga	tattananac	tctgaacaca	agtttgtatt	gaaggacaag	1740
gaagagetee	tcatacaytga	aataactcat	cttgaccgtg	tgaagaacat	gacaggcttg	1800
adcaagccca	ttaataagaa	tactcatcta	aaggatttgg	caaaccttgt	gattgtcgct	1860
geegagaege	gcaaggagtc	caaggatagg	gaggagcagg	ctgagttcaa	aaggatgtac	1920
agteteattg	aggagtacaa	gctggaggg	catatccggt	ggatctcagc	tcagatgaac	1980
catattcaca	atgcagagtt	gtaccgctac	atttgtgaca	ccaagggcgc	atttgttcag	2040
cctgcattct	atgaagcatt	tggcctgact	gttgtcgagg	ccatgacatg	tggtttgccc	2100
acaatagcga	cataccataa	tggcccagct	gaaatcattg	tgaatggtgt	gtctggtttg	2160
cacatcgatc	cttaccacag	tgacaaggct	gcagatatcc	tggtcaactt	ctttgagaaa	2220
tccacggcag	atccaaccta	ctgggacaaa	atgtcggaag	gtggcctgaa	gagaatttat	2280
gagaagtaca	cctggaagct	gtactcagag	aggctgatga	ccctgactgg	tgtatatggt	2340
ttctggaagt	atgtgagcaa	ccttgagagg	cgtgagactc	gccgttacct	tgagatgttc	2400
tacgctctga	. agtaccgcag	cctggctgct	gcagttccat	tggccgtcga	tggcgagaac	2460
acggacaatt	agtgcgggac	atgaagaggc	gccttcaaag	ggcgaggtgt	cggctgcgtt	2520
atgatttgat	tgtctaccgg	agttttcatt	tggtctattg	tggagtgtgt	acttggatgt	2580
ctcaggcact	: tctgtgaggt	tttgggcagt	tctttgctgg	ttcctgctag	ctgcatatgt	2640
		ccgtattgtt	catctcttat	aattcaatgc	aatcttctgt	2700 2716
tgcctaaaaa	aaaaaa					2/16
4010× 10						
<210> 13 <211> 2754						
<211> 2/54 <212> DNA	<u>.</u>					
	uca arundin	2002				
/213/ F62C	.uca arunurn	acea				
<400> 13						
gctggggttt	tgttgctcct	gtctatttat	: tatcccctct	ggatcttgag	aaaccctccg	60
ccatttaact	tetecetea	cccccttcac	: catttgtttt	gtgtcctgag	, ccatggctgc	120
caagctgact	cotctccaca	atctccaaaa	ı gcaccttggt	. gccaccttct	cctcccatcc	180
caacgagcto	attaccetet	tttccaaqta	, tgttcaccag	ggcaaaggaa	tgcttcagcg	240
ccaccagete	r ctcactgagt	ttgaagcatt	: atttgagtct	gacaaggaga	ggtatgcacc	300
ttttcaagac	c attctccgtg	ctacccaaaa	ı agcaattgtg	cttcccccat	gggttgcact	360
taccatcaac	r cccaggcctg	atatctaaaa	ı ctacataagg	gtgaatgtta	gcgagttggc	420
cattaaaaa	r ctgacagttt	ccgagtacct	: agcattcaag	gagcagcttg	f ttgatgagca	480
caccaacaa	c aagtttgtgc	: ttgagcttga	ı ttttgagcct	: ttcaatgcct	ccttcccacg	540
tecttecate	r tccaaqtcca	ttggaaatgg	, aatacaatto	: cttaaccgtc	acctgtcttc	600
caagctgtto	c caggacaagg	agagcctcta	a cccactactg	aacttcctga	aagcccataa	660
ccacaaggg	c acgacaatga	. tgctaaacga	a cagaattacg	agcettegte	g ggctccaatc	720

agcccttaga aaggcagaag agtatctaac aagcatcctt gaagacaccc cgtccttt	ga 780
gttcaaccac aggttccaag agcttggctt ggagaagggt tggggtgaca ccgctaag	cg 840
tgtacaggac accatecact tgettettga tetgettgag geceetgate cagecage	tt 900
tgladaggad addatedate tgettettga gettettga gettettga g	
ggagaagttc cttggaacta taccgatgat gttcaatgtc gttatcctgt ctccacac	- 1000
atattttgct caatccaatg tgttgggata ccctgatacc ggtggccagg ttgtgtac	at 1020
cttggatcaa gtccgtgctt tggagaatga gatgcttctg aggattaagc agcaaggc	ct 1080
tgacataacc cctaagatcc tcattgtcac caggttgttg cctgatgctg ttggaact	ac 1140
atgtggccag cggctggaga aggttattgg gactgagcac actgacattc ttcgtgtt	cc 1200
atgreggeday eggetagaga aggregataga garagagata at eggetataga et aggregataga garagagataga garagaga garagagataga garagagataga garagagataga garagagataga garagagataga garagaga gar	ta 1260
attcagaact gaaaagggga tcctccgtaa gtggatatct cgttttgatg tctggcca	
cctggagaca tacaccgagg atgttgcaaa cgaactcatg agagaaatgc agaccaag	1320
tgatctcatt attggcaact acagtgacgg taaccttgtc gccactctgc tcgcgcat	aa 1380
gttgggagtt acccagtgca ctattgccca tgctttggag aaaaccaaat accccaac	tc 1440
agacatatat ttggacaaat tcgacagcca ataccatttc tcatgccagt tcactgct	ga 1500
ccttattgcc atgaatcaca ctgatttcat catcaccagc acattccagg aaattgct	aa 1560
Contacting and a contact the second and a contact and a co	55
aagcaaggac agcgtgggcc agtatgagtc tcacattgct ttcaccctcc ctgatctc	1620
ccgtgttgtc catgggattg acgtgttcga tcccaagttc aacattgtct ctcctgga	gc 1680
agatatgage gtetacttee catacactga aactgacaag aggettactg cettecae	cc 1740
tgaaattgaa gagctccttt acagcgatgt tgagaactct gaacacaagt ttgtattg	aa 1800
ggacaagaac aagccgatca tettetcaat ggetegeett gaccgtgtga agaacatg	ac 1860
ggacaagaac aageegacea tereseata ggacagacea gacagacaa agaataa	at 1920
aggettggtt gagatgttcg gtaagaatge teatetgaag gatttggeaa acettgtg	1000
tgtcgctggt gaccatggca aggagtccaa ggatagggag gagcaggctg agttcaaa	ag 1980
gatgtacagt ctcattgagg agtacaagct gaagggccat atccggtgga tctcagct	ca 2040
gatgaaccgt gttcgcaatg cggagttgta ccgctacatc tgtgacacca agggcgca	tt 2100
tgttcagccc gcgttctatg aagcatttgg cctgactgtt atcgaggcca tgacatgt	aa 2160
typicaged gegeteraty agent areas areas at art areas at a traction	tc 2220
tttgccgaca atagcgacat gccatggtgg cccagctgaa atcattgtgg atggtgtg	tt 2280
tggtttgcac atcgatcctt accacagtga caaggctgca gatatcctgg tcaactte	2280
tgagaaatcc acggcggatc caacctactg ggacaaaatg tcggaaggag gcctgaag	ag 2340
aatttatgag aagtacacct ggaagctgta ctcagagagg ctgatgaccc tgactggt	gt 2400
atatggtttc tggaagtacg tgagcaacct tgagaggcgt gagactcgcc gttacctt	ga 2460
gatgttctac gctctgaagt accgcagcct ggcagctgca gttccattgg ctgtcgac	ag 2520
gargitelae gereigaagt acceptageer gereigaa gereigaag	22
cgagaacacc gacagttagt gcagaggege ctttegeggg caaagtattg getgegtt	.at 2300
gatttgtcta ccgtagtttc catttggtct attatggggt gtgtaccttg atgttggg	gt 2640
gtgtaccttg atgtttggca ctttcctgag gtttctgggc agtgctttgc tggttcct	ac 2700
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagetgeata tgttgeette aataaaegee tgeecatatt gtteaaaaaa aaaa	2754
tagetgeata tgttgeette aataaaegee tgeecatatt gtteaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa	2754
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag	2754 gca 60
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatgggggaag cgcgggaaggggaaggggaaggggaaggggaaggggaaggggaagggg	2754 gca 60 atc 120
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgaaggcgaacgcactccc tctccgccca ccccaatgag ctcgtcgcg tcttcaccag gctggtca	2754 gca 60 atc 120 aac 180
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgacggcacccc tctccgccca ccccaatgag ctcgtcgcg tcttcaccag gctggtcgcttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatcc	2754 gca 60 atc 120 aac 180 cct 240
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgacggcacccc tctccgccca ccccaatgag ctcgtcgcg tcttcaccag gctggtcgcttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatcc	2754 gca 60 atc 120 acc 180 act 240 ag 300
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgaaggcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtcgcttggaaggggaaggggaaggcgaaggggaaggcgaagaggggaaggcgaagaggggaaggcggaaggggaaggggaaggggaaggggaaggagg	gca 60 atc 120 aac 180 cct 240 cag 300
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatggggaag ccgcggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gcgggaagcgaagagggaaggga	2754 gca 60 atc 120 acc 180 act 240 agg 300 agg 360
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatgggggaag ccgccggcga ccgtgtgctg agccgcctcc acagcgtcag ggagcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtccttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatcggaggaagcagagagcgaatcg tcatctccc atgggttgc cttgcagag atgtactgag ggcgagcgaatcg tcatctccc atgggttgca cttgcaatcc gccctaggcc tggtgtctgagtatgagagcagagagagcaatcg tcatctccc atgggttgca cttgcaatcc gccctaggcc tggtgtctgagtatgagagagagagagagagagagagaga	2754 gca 60 atc 120 acc 180 act 240 agg 360 agg 360 acc 420
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatgggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgactcc tctccgcca ccccaatgag ctcgtcgcgg tcttcaccag gctggtcgtcttggaaggg gaatgctgca gcccaccag atcatcgctg agtacacac tgcaatcggaagcagaggaagct caaggacggc gccttcgagg atgtactgag ggagcgaggaggaggaatcg tcatctccc atggatgc cttgcagag agtactgag ggagcgagttgagtgaggagttgagtgaggagttgagtgag	2754 gca 60 atc 120 acc 180 act 240 agg 360 agg 360 acc 420 gac 480
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgagatgggggaag ccgcggcga ccgtgtgctg agccgctcc acagcgtcag ggagcaccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtccttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatcggaggaagcaatcg tcatctccc atggatgcg gccttcgagg atgtactgag ggagcaatcg tcatctccc atggatgc cttgcagag agttactgag ggagcaatcg tcatctccc atggatgc cttgcagag agttactgag ggcagcgttgagtatgtga gagtcaacgt tgtggaagga agcaacaaag acttcgtgt tgagctgtttgagttca aggaacagct tgtggaagga agcaacaaag acttcgtgct tgagctgtttgagcaatcg tcaatgcct cttccctgt ccttcctgt cgaagtccat tggcaacg	2754 gca 60 atc 120 acc 180 act 240 agg 360 acg 420 gac 480 ggt 540
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atgggggaag ccgcggcga cccaatgag ctcgtcgcg tcttcaccag ggagcgac cccaatgag ctcgtcgcg atcaccac gaagcagag gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatcg gaggcaatcg tcatctccc atgggttga cttgcagta atgactgag gggagcatcg gaggaagct caaggacggc gccttcgagg atgtactgag ggcagcatcg atgacaacac tgcaatcg gaggcaatcg tcatctccc atgggttga cttgccatc gcctaggcc tggtgtct gagtatgtga gagtcaacgt tgtggaagga agtagtgatgt ccctgagt ttgcagttca aggacagct tgtggaagga agcaacaaag acttcgtgct tgagctg tttgagcat tcaatgcct cttccctcgt ccttccctgt cgaagtccat tggcaacgggagcat tcaatgcctc cttccctcgt ccttccctgt cgaagtccat tggcaacgggagcatgtcaatggcaccctgtcatca aagcacttcc atgacaagga gagcatgt	2754 gca 60 atc 120 acc 180 acc 240 agg 360 acc 420 gac 480 ggt 540 acc 600
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atgggggaag ccgcggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgactcc tctccgcca ccccaatgag ctcgtcgcgg attcaccag gctggtcg gaaggcaatgg ggagaagct caaggacggc gcccaccag atcatcgctg agtacaacac tgcaatcg gaggcaatcg tcatctccc atgggttga cttgcagg atgtactgag ggcgactcg atggtcgag atgtactgag ggcgactcg atggtcgag atgtactgag gagcaatgg tcatctccc atgggttga cttgcagag atgtactgag ggcagcggagttgagtagtagtag gagcaacgt tgtggaagga agtagtagtg ccttgagg agttagtgt ccctgagg tttgagcat tcaatgcctc cttccctcgt ccttccctgt cgaagtcat tggcaacggt gtgcagtcc tcaataggca cctgtcatca aagctcttcc atgacaagga gagcatgt cctttgctca acttcctccg tgcacacaac tacaagggca tgcctatgat gatgaacga cctttcacacac tacaaggca tacaagga gagcatgt cctttgctca acttcctccg tgcacacaac tacaagggca tgcctatgat gatgaacga	2754 gca 60 atc 120 acc 180 acc 240 agg 360 agg 360 agc 420 gac 480 agg 540 agc 600 agac 660
tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atgggggaag ccgcggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgactcc tctccgcca ccccaatgag ctcgtcgcgg attcaccag gctggtcg gaaggcaatgg ggagaagct caaggacggc gcccaccag atcatcgctg agtacaacac tgcaatcg gaggcaatcg tcatctccc atgggttga cttgcagg atgtactgag ggcgactcg atggtcgag atgtactgag ggcgactcg atggtcgag atgtactgag gagcaatgg tcatctccc atgggttga cttgcagag atgtactgag ggcagcggagttgagtagtagtag gagcaacgt tgtggaagga agtagtagtg ccttgagg agttagtgt ccctgagg tttgagcat tcaatgcctc cttccctcgt ccttccctgt cgaagtcat tggcaacggt gtgcagtcc tcaataggca cctgtcatca aagctcttcc atgacaagga gagcatgt cctttgctca acttcctccg tgcacacaac tacaagggca tgcctatgat gatgaacga cctttcacacac tacaaggca tacaagga gagcatgt cctttgctca acttcctccg tgcacacaac tacaagggca tgcctatgat gatgaacga	2754 gca 60 atc 120 acc 180 act 240 ag 300 agg 360 agg 420 ggac 480 agg 540 acc 660 acc 720
<pre>tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgaa ggcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtca cttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatca gaagcagagc gcgagaagct caaggacggc gccttcgagg atgtactgag ggcagcgagagagatgtgagagagagagagagagagagag</pre>	2754 gca 60 atc 120 acc 180 acc 240 agg 360 agg 360 acc 420 ggac 480 ggt 540 acc 600 acc 660 acc 720
<pre>tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgaa ggcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtca cttggaaagg gaatgctgca gcccaccag atcatcgctg agtacaacac tgcaatca gaagcagagc gcgagaagct caaggacggc gccttcgagg atgtactgag ggcagcgagagagagagagagagagagagagagaga</pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 ggc 480 ggt 540 cac 600 gac 660 cct 720 ctg 780
<pre>tagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <211> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga agaagcggaa ggtttgag atggggaag ccgccggcga ccgtgtgctg agccgctcc acagcgtcag ggagcgaa ggcgactccc tctccgcca ccccaatgag ctcgtcgcg tcttcaccag gctggtca cttggaaagg gaatgctgca gccccaccag atcatcgctg agtacaacac tgcaatca gaggcaatcg tcatctccc atgggttgca cttgccatca gcctaggcg gagtatgtga gagtcaacgt gaggaggctt gctgcaacaa agtactgag ggcaggag ttgcagttca aggaacagct tgtggaagga agcaacaaag acttcgtgct tgaggcg tttgagcat tcaatgcctc cttccctcgt ccttccctgt cgagtcattggcagtcatcaatgag ccttccatgagg agcaacaaag gtcgagttcc ctaatagcacccctgcaacaacaacaaagacaaagacaaagacaaaagacaaaagacaaaagacaaaagacaaaagacaaaagacaaaagacaaaagacaaaaaa</pre>	gca 60 atc 120 acc 180 acc 240 acc 420 gac 480 acc 420 gac 660 acc 720 acc 720 acc 780 gac 840
<pre></pre>	gca 60 atc 120 acc 180 acc 240 acc 420 gca 480 acc 420 gca 660 acc 720 acc 720 acc 720 acc 780 gca 840 gcg 900
<pre></pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 gac 480 ggt 540 cac 600 cac 600 cat 720 ctt 780 gac 840 gtt 900 cac 960
<pre></pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cag 420 gac 480 gac 660 cac 660 cat 720 ctg 780 gac 840 gtg 900 cac 960 gag 1020
<pre></pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cag 420 gac 480 gac 660 cac 660 cat 720 ctg 780 gac 840 gtg 900 cac 960 gag 1020
<pre></pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 gac 480 ggt 540 cac 660 cct 720 cct 720 cct 780 gac 840 gtg 900 cac 960 gac 960 gac 1020 acc 1080
<pre></pre>	2754 gca 60 atc 120 acc 180 acc 240 agg 360 acc 420 gac 480 ggt 540 acc 660 act 720 act 720 act 780 gac 840 gac 960 gac 960 gac 1020 acc 1080 ggt 140
<pre></pre>	2754 gca 60 atc 120 acc 180 acc 240 agg 360 acc 420 gac 480 ggt 540 acc 660 acc 720 acc 780 gac 840 gtg 900 acc 960 gac 960 gag 1020 acc 1080 ggt 1140 aca 1200
<pre></pre>	2754 gca 60 atc 120 acc 180 acc 240 agg 360 acc 420 gac 480 ggt 540 acc 660 acc 720 acc 660 acc 720 acc 960 gac 960 gac 1020 acc 1080 aggt 1140 acc 1260
<pre></pre>	2754 gca 60 atc 120 acc 180 acc 240 agg 360 acc 420 gac 480 ggt 540 acc 660 acc 720 acc 660 acc 720 acc 960 gac 960 gac 1020 acc 1080 ggt 1140 acc 1260 acc 1260 acc 1260 acc 1320
<pre>cagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <221> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga acagcggaa ggaggactccc tctccgcca cccaatgag ctcgtcgcgg tcttgaaagg gaatgctgaa ggcgactccc taacgaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaagggaaggcgaagggaaggcgaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaaggaaggagggg</pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 ggac 480 ggt 540 cac 600 cac 660 cct 720 ctg 780 gac 840 gtg 900 cac 960 gac 1020 acc 1080 ggt 1140 aca 1260 gga 1320 cat 1380
<pre>cagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <221> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga acagcggaa ggaggactccc tctccgcca cccaatgag ctcgtcgcgg tcttgaaagg gaatgctgaa ggcgactccc taacgaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaagggaaggcgaagggaaggcgaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaaggaaggagggg</pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 ggac 480 ggt 540 cac 600 cac 660 cct 720 ctg 780 gac 840 gtg 900 cac 960 gac 1020 acc 1080 ggt 1140 aca 1260 gga 1320 cat 1380
<pre> - tagctgcata tgttgccttc aataaacgcc tgcccatatt gtcaaaaaa aaaa - <210> 14 - <211> 2950 - <212> DNA - <213> Lolium perenne - <400> 14 - ttcttcctcg tggtgcgttg ccgtttgtcgg atggggactccc tctccgcca cccaatgag ctgtggaagg ggaagcagaaggaaggaaggaaggaaggaagga</pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 gac 480 ggt 540 cac 660 cct 720 ctg 780 gac 840 gtg 900 cac 960 gac 960 gac 1020 acc 1080 ggt 1140 aca 1260 ggt 1320 cac 1380 cac 1440
<pre>cagctgcata tgttgccttc aataaacgcc tgcccatatt gttcaaaaaa aaaa <210> 14 <221> 2950 <212> DNA <213> Lolium perenne <400> 14 ttcttcctcg tggtgcgttg cgtttgtcgg gttcttctga acagcggaa ggaggactccc tctccgcca cccaatgag ctcgtcgcgg tcttgaaagg gaatgctgaa ggcgactccc taacgaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaaggcgaagggaaggcgaagggaaggcgaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaagggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaaggaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaagaaggaaggagggg</pre>	2754 gca 60 atc 120 acc 180 cct 240 cag 300 cgg 360 cac 420 gac 480 ggt 540 cac 660 cct 720 ctg 780 gac 840 gtg 900 cac 960 gac 960 gac 1020 acc 1080 ggt 1140 aca 1260 ggt 1320 cac 1380 cac 1440

atcacaagta ccttccaaga gattgctgga aacaaggaca ccgttggtca gtacgagtct	1560
cacatggcat tcacgatgcc tggaatgtac cgtgttgtcc acggtatcga tgtttttgac	1620
cccaagttta acatagtttc gcctggtgcg gacatgtcca tctacttccc gtactcagag	1680
tcacaaagga ggctcacctc actccaccca gagattgagg agctgctcta cagtgatgtc	1740
gacaacgatg agcacagttg tctgaaggac aggaacaagc caatcatctt ctcgatggct	1800
cgtctggacc gtgtcaagaa cttgactggt ctggttgagc tgtatggccg gaaccctcgc	1860
egtetggae gtgteagaa ettgaetggt etggtgage tgtatggeg gateetege	1920
ttgcaggage ttgttaacct tgtggttgtt tgtggtgace atggcaacce atcaaaggae	1980
aaggaggagc aggctgagtt caaaaagatg tttgacctta ttgaacagta caacctgaat	
ggccatatcc gctggatctc tgctcagatg aaccgtgtcc gtaatgctga gctctatcgc	2040
tacatctgcg acaccaaggg tgcttttgtg cagcctgcat tctatgaggc tttcgggcta	2100
actgtcatcg aggccatgac ctgtggtctt ccaacatttg caactgcata tggtggtcca	2160
gctgagatca tcgtgaacgg tgtctccggc taccacattg atccttacca gggtgacaag	2220
gcctcggctc tgctcgttga gttctttgag aagtgccagg gagaccacag ccactggacc	2280
aagatotoac tgggagggot toagogtatt gaggagaaat acacotggaa gotttactot	2340
gagaggetga tgacceteae eggtgtetat ggettetgga agtaegtete caacettgag	2400
aggogtgaga coogcogota cotggaaatg otgtacgogo toaagtacog caccatggoo	2460
agcactqttc cattggctgt cgagggggag ccctcgagca agtgatctgg ccacctatcg	2520
gccggaagaa gaagaagaag gttggcttcg atttctgaaa gatttgagat ttgagaatgc	2580
gttggttttc ttcctaggcg ctgctctttt agagttaagg tcgagttgat gtgctagttt	2640
gattcagcag tgggagtgag ttgagacaga aggatgtggt gtgtgccagt attgttggtg	2700
cttttcgtgt tctttggatg ttacccttga ataatagtag cggccttggc gccgtttctg	2760
aaataatagt agcatccttg ctcgttgcca agaaaatctt agttttttt tctcttgaac	2820
aagtggcaaa gcgacctctg catctatctc tgtcattgac atttagctct gttgcggtgc	2880
actggatacc ttacattgct ctagagaaca gcaataaaag ccggaccatg tgattgctgt	2940
	2950
aaaaaaaaaa	2000
<210> 15	
<211> 2825	
<212> DNA	
<213> Festuca arundinacea	
1400. 45	
<400> 15	60
gegegtttcc cctacctgtg acgttcccgt gtttcccctt ccgggcgctc tcgcctcctt	120
cttcctcaga gcaaggtttg aggatccgac tggaggatag caatggggga gagtgcagga	
gagegtgete tgageegtet ceacagegta agggagegta teggegatte eeteteageg	180
cacaccaatg agctcgtcgc cgtcttctca aggcttgtta accatggaaa gggaatgctt	240
cagececace agateactge tgagtacaat getgetatte eegaggetga gegagagaag	300
ctgaaggata ccgcctttga ggatctccta aggggggcac aggaggcaat tgtcatccct	360
ccatgggttg ctctcgccat ccggccaagg cctggcgtct gggagtatgt gagggtcaat	420
gtgagcgagc tcggcgttga ggagttgagt gtccctgagt atttgcaatt caaggaacaa	480
ttggtgaatg aaagcactga taacaacttt gtgcttgagc tggactttgg gccattcaat	540
gcctccttcc ctcggccatc gctgtcgaag tctattggca atggtgtgca gttcttgaac	600
aggcacctgt catcaaagct gttccatgac aaggagagca tgtacccctt gctcaacttc	660
ctccgtgcac acaactacaa ggggatgacc atgatgttga acgacagaat tcgcagtctc	720
agtgccctcc aagatgcact caggaaggca gagaagcatc tgtcaggcct tccagctgac	780
accccgtact cagagttcca ccaccggttc caggaacttg gtttggagaa aggttggggc	840
gactgtactc agcgtgcaca cgagactatt caccttctct tggaccttct cgaggcccct	900
gatccatcca ccttggaaaa gtttctcgga acaatcccaa tggtgttcaa tgttgtcatc	960
ctctctcctc atggttactt tgctcaggcc aatgtcttgg ggtacccaga cactggtggg	1020
caggttgtct acattttgga ccaagtccgt gctatggaga atgagatgct attgagaatc	1080
aagcagcaag gtcttgacat tacaccaaag attctaatag tcaccaggtt gctccctgat	
the state of the s	1140
gcacacggca ccacctgcgg ccagcgcctt gagaaggtcc ttggcactga gcacacccac	1140 1200
gcacacggca ccacctgcgg ccagcgcctt gagaaggtcc ttggcactga gcacacccac	
attctqcqtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt	1200
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag	1200 1260
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag ctgcaggcca accctgactt gatcattgga aactacagtg atggaaacct tgtcgcgtgt	1200 1260 1320 1380
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag ctgcaggcca accctgactt gatcattgga aactacagtg atggaaacct tgtcgcgtgt ttgttggcac acaagttggg ggttactcat tgtaccattg ctcatgccct agagaaaacc	1200 1260 1320 1380 1440
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag ctgcaggcca accctgactt gatcattgga aactacagtg atggaaacct tgtcgcgtgt ttgttggcac acaagttggg ggttactcat tgtaccattg ctcatgccct agagaaaacc aagtacccca actctgacct ttactggaag aaatttgagg atcactacca cttttcctgc	1200 1260 1320 1380 1440 1500
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag ctgcaggcca accctgactt gatcattgga aactacagtg atggaaacct tgtcgcgtgt ttgttggcac acaagttggg ggttactcat tgtaccattg ctcatgccct agagaaaacc aagtacccca actctgacct ttactggaag aaatttgagg atcactacca cttttcctgc cagttcacag ctgacctgat tgcaatgaac catgctgact tcatcatcac cagtaccttc	1200 1260 1320 1380 1440 1500
attctgcgtg tgccattcaa aacagaagat gggattgttc gcaaatggat ctcacgtttt gaagtctggc cttacctgga agcttacacc gatgatgtgg cacatgagat tgctggagag ctgcaggcca accctgactt gatcattgga aactacagtg atggaaacct tgtcgcgtgt ttgttggcac acaagttggg ggttactcat tgtaccattg ctcatgccct agagaaaacc aagtacccca actctgacct ttactggaag aaatttgagg atcactacca cttttcctgc cagttcacag ctgacctgat tgcaatgaac catgctgact tcatcatcac cagtaccttc caagagattg ctggaaacaa ggatactgta gggcagtatg agtcgcacat ggcattcaca	1200 1260 1320 1380 1440 1500 1560
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettaeetgga agettaeaee gatgatgtgg cacatgagat tgetggagag etgeaggeea accetgaett gateattgga aactaeagtg atggaaacet tgtegegtgt ttgttggeae acaagttggg ggttaeteat tgtaeeattg etcatgeeet agagaaaaee aagtaeeea actetgaeet ttaetggaag aaatttgagg ateaetaeea ettteetge eagtteaeag etgaeetgat tgeaatgaae eatgetgaet teateateae eagtaeette eaagagattg etggaaacaa ggataetgta gggeagtatg agtegeaeat ggeatteaea atgeetggee tetategtgt tgteeatggt attgatgtet tegaeeecaa gtteaaeate	1200 1260 1320 1380 1440 1500 1560 1620 1680
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettaectgga agettaeaee gatgatgtgg cacatgagat tgetggagag etgeaggeea accetgaett gateattgga aactaeagtg atggaaacet tgtegegtgt tgttggeae acaagttggg ggttaeteat tgtaecattg etcatgeeet agagaaaaee aagtaeeea actetgaeet ttaetggaag aaatttgagg ateaetaeea ettteetge eagtteaeag etgaeetgat tgeaatgaae eatgetgaet teateateae eagtaeette eaagagattg etggaaacaa ggataetgta gggeagtatg agtegeaeat ggeatteaea atgeetggee tetategtgt tgteeatggt attgatgtet tegaeeecaa gtteaeaea gteteeeetg gtgetgaeat gaeeatetae etgaeeaea gaagaggett	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettaectgga agettaeace gatgatgtgg cacatgagat tgetgggagg etgeaggeca accetgaett gateattgga aactacagtg atggaaacet tgtegegtgt tgttgggaca acaagttggg ggttaeteat tgtaecattg etcatgeet agagaaaace aagtaececa actetgaeet ttaetggaag aaatttgagg ateaetaeca etttteetge eagtteacag etgaectgat tgeaatgaac eatgetgaet teateateae eagtaectte eaagagattg etggaaacaa ggataetgta gggeagtatg agtegeaeat ggeatteaea atgeetggee tetategtgt tgteeatggt attgatgtet tegaececaa gtteaacate gteteeeetg gtgetgaeat gaecatetae tteeeataea etgaacaaca gaagaggett aecteeetee atgetgagat tgaggageta etetteagtg atgtegagaa tteetgageae	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1800
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettaectgga agettaeaee gatgatgtgg cacatgagat tgetggagag etgeaggeea accetgaett gateattgga aactacagtg atggaaacet tgetggagag ttgttgtggeae acaagttggg ggttaeteat tgtaecattg etcatgeet agagaaaaee aagtaeeea actetgaeet taetggaag aaatttgagg ateaetaee eagtteaea etgeaatgaae eaagtagaat etgaaatgaae eaagtagaat etgaaatgaae eaagtagaat gegaaaeaa ggataetgta ggeagtatg agegaeaa ggeatteaea atgeetggee tetategtgt tgteeatggt attgatgtet tegaeeeaa gteaeate gteteeeetg gtgetgaeat gaeeatetae tteeeataea etgaaeaaae gaagageet aacteeetee atgetgagat tgaggageta etetteagtg atgtegagaa ttetgageae aaatttgtge tgaaggaeaa gaaeaageea ateaetetet egatggetag getggaeegt	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1800 1860
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettacetgga agettacace gatgatgtgg cacatgagat tgetggagag etgeaggeca accetgactt gateattgga aactacagtg atggaaacet tgetgggagag etgetggeca acaagttggg ggttacteat tgtaceattg etcatgecet agagaaaace aagtaceca actetgacet ttactggaag aaatttgagg atcactacea etgetgacat etgeaatgaac eatgetgact teatcacaca etgetgacat etgeaatgaac eatgetgact teatcacaca atgeetgge tetateggt tgeeatggat atggaagtat etgeacaca ggtacacat etgeecetgg tetateggt atgacatacac etgeteecetg gtgetgacat etgecatggt attgatgata etgeacacaca etgeacacaca aacteteece atgetgagat tgaggageta etetteagtg atgtegagaa ttetgageac aaatttgtge tgaaggacaa gaacaageca atcatetee egatggetag getggacegt gteaaagaata tgaetggeet ggttgaactg tatggeegga acceaegeet acaggagetg	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1800 1860 1920
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettacetgga agettacace gatgatgtgg cacatgagat tgetggagag etgeaggeca accetgactt gateattgga aactacagtg atggaaacet tgtegegtgt ttgttggeae acaagttggg ggttacteat tgtaceattg etcatgeect agagaaaace aagtaceca actetgacet ttactggaag aaatttgagg atcaetacea ettteetge cagtteacag etgaacaca ggatactgta gggeagtatg etgaaacaa ggatactgta gggeagtatg agtegeacat geacatecae etatecectg etcatecetg tgtecatggt attgatgtet tegaacacae ggatacetae gteecectg gtgetgacat gaceateae etecataca etgaacaacae gacaggett ageegacae ateategte etetategga attgaggacae gacaacae etetecatge etgaacaaca gacaggett ageegacae etetecatge etgaacaacae etetecatge etgaacaacae gacaggett etgaacacae etetecatge etgaacaacae etgaacaacae etgaacaacae etgaacaacae etgaacaacae etgaacaacae etetecatge etgaacaacae etetecatge etgaacaacae etgaacacae etgaacaacae etgaacacae etgaacacaeae etgaacacaeaeaeaeaeaeaeaeaeaeaeaeaeaeaeaeae	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1800 1920 1980
attetgegtg tgecatteaa aacagaagat gggattgtte gcaaatggat etcaegtttt gaagtetgge ettacetgga agettacace gatgatgtgg cacatgagat tgetggagag etgeaggeca accetgactt gateattgga aactacagtg atggaaacet tgetgggagag etgetggeca acaagttggg ggttacteat tgtaceattg etcatgecet agagaaaace aagtaceca actetgacet ttactggaag aaatttgagg atcactacea etgetgacat etgeaatgaac eatgetgact teatcacaca etgetgacat etgeaatgaac eatgetgact teatcacaca atgeetgge tetateggt tgeeatggat atggaagtat etgeacaca ggtacacat etgeecetgg tetateggt atgacatacac etgeteecetg gtgetgacat etgecatggt attgatgata etgeacacaca etgeacacaca aacteteece atgetgagat tgaggageta etetteagtg atgtegagaa ttetgageac aaatttgtge tgaaggacaa gaacaageca atcatetee egatggetag getggacegt gteaaagaata tgaetggeet ggttgaactg tatggeegga acceaegeet acaggagetg	1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1800 1860 1920

atgaagggag gccatgacat gtgaatggcg ctcgtggagt ggcggactcc accctctctg cgtcgctacc ttggctattg cggaccaggg tatgcctttg tgttgtctgt	ctcagatgaa cctttgtgca gtggcctccc tgtctggcta tctttgagaa agcgcatcga gtgtctatgg ttgagatgct aaggcgagac ccccactttc ctttcctag ggtagaggaa gctatgattt	gcctgctttc cacattcgcc ccacatcgat gtgccaggaa ggagaagtac ttcttggaag ctacgctctc cacaggcaaa ccattcctga gttgtagttt ctggatgtga	tatgaggcct actgcatacg ccataccaga gacccaagcc acctggaagc tacgtctcca aagtaccgca tgatttggcc ttcagcattg gagggaagtt gggatgtact	tcgggcttac gtggtccagc atgacaaggc actggaacaa tgtactctga accttgacag aaatggctac tcatcgaaga aagcacagat ggttcccgtg cagtgctccg	cgtgatagag tgagatcatt ctctgcgctg gatctcgcag gaggctgatg gcgtgagact caccgttcca aataaaaggg cggagagttt agagtctctg gttggtact	2100 2160 2220 2280 2340 2400 2460 2520 2580 2640 2700 2760 2820 2825
<210> 16 <211> 1599 <212> DNA <213> Fest	uca arundina	acea				
ggtccgcctc atgtagagaa ttatagaatg acccaggcga tatcaattgg ttctgaattg agtgcctgga ctattccgaa tgattggggt gttggttgtt cgaaaaatag atgtcgcaaa atggcaagca tcaactatca ctttgcaggc ttgatccttc atggtggtat ctgttgtgca aatatagaag aatttgatct ttggagagctt ttgtcgatgat gagagagctt ttgtcgatgat gagagagctt ttgtcgatgat gcaccagat gtgatgatta ctcattcgta tcaattatcc	acttgaaccc agccacagtt tcatcaggtt gaccaaggca gttcagggat agctgaggtg gagtagagtt cttcttcgcg aggcgccaaa ttatgatctc gccgaggatc gaggaggatc aggctgggca gttgctgcaa aggactagat tgatgtggag ctgggcttttg agggcttttg gcgttttc gtcttcctg tgaaaaggaa tgggggcggt cgggagtgcc cagggcatgg acacagaaaa caaataaacg atatactata	atatctggta caaaacattg tgcaataacc ccgacgacag aacggttaca gatcacccac gtattaccgg catgtcctca gaacatgatg ggattacaggca atatggggtt ggtatctatg tggccagttg ctggagaagg atagattttg gatcccgaaa ggacttgtta tacaaatcac agaacaaggac aggaggatat ggcagggtct cacatgtatg agcatgatga gctaattcct gaaattcac gaaattcac	gtcaaccggt cgcttcctaa cagtgctcca gttggatcgg gtgcagcact tgtattcatc gcagtaacgg aagtcagcgt cattactatgc ggactaatga caattcccag aagagattga gagatctta agctgacgtc agcattgccg ttctggccac agaaagaata tgatgacgcac ctctgagaac ctctgagaac gtatcatagc gtatcatagc gtatcatagc	catcatgtac gaaccggtct accggttgga gccggatgga tttgtacaag cagtgcctcc tggactggac	accggtggcg gacccgtacc ccaggaatga ctatggagaa agtgaagact actatgtggg ctgtccgcag gacaagtaca ctcgatgacc ttcttcgact tcttcagatg ctagaccgtg agaaatgaaa ggagttgaca gccgactctt gcatcagttc gaggagcaca atgtgctttg cggtcggg ccagtggcga acggtcaggg aaaggctgaa ttcatgagca	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1140 1200 1320 1320 1380 1440 1500 1599
<210> 17 <211> 2010 <212> DNA <213> Loli	um perenne					
ggtgctgctt ctcggccgcg ccacttccag atggtatcac ggcgcactcg gaccatcccg cactccggcg catcgccctg	ccctattaac ctcctgcagc tcgccgtcgg cccccatga ctgttctacc gtgtcccgcg acggaccagt acctagtaca cccaagaacg gcggtgccgg	tegecteege teccagecte actggateaa agtacaacce acctgateaa acggegtgtg eggggatega egteggaece tggaaggtat	atctcaccat cattgttagc cgatccaaat caagggcgcg ctggatcgcc gtccggttcg ccggccgagc tctcctccgg aaacgcgacg	gcccgcctga ccgctgctca gggccgttgt gtgtggggca cttgagccgg acgacgatcc gtcaactacc gaatggtaca cagttccgcg	gcctggagac ggacaggcta actacaaggg acatcatctg cgatctcgcc tccacgacgg agatccagaa agccggggta acccgaccac	60 120 180 240 300 360 420 480 540 600 660

ccgcggggag (acaattctat	accggagccg	cgacttcaag	cactgggtcc	gcgccaagca	720
cccgctgcac	teggegetea	ccaacatata	ggagtgcccg	gacttcttcc	cggtgggcaa	780
ggccggggtg	aaaaaaacc	togacacctc	cgagtacggc	acadcaacaa	gcgtggagaa	840
gcacgtgctg	aagaacagcc	tcgacctcac	ccactacaac	tactacacca	toggcacgta	900
cgacaacgtc	aagaacaat	acataccaaa	caaccccacc	aacaacatct	accagegeet	960
ccagtacgac	taccccaact	tctacacatc	caagaccttc	ttcgaccccg	tgaagcagcg	1020
ccggatcctc	atacggcaacc	ggaaggge	caataacata	acceacasea	addccaaddd	1080
ctgggccggg	ctggggtggg	these	cgatagegeg	geceaegaea	aggeodaggg	1140
cradaccada	atccaggcga	LLCCCaggaa	gatatygett	paccecageg	naattaaaa	1200
ggtgcagtgg	ccggtggagg	agctcgagaa	gereegggge	aageetgtea	acgurgguga	1260
caaggtcgtc	aagcccggcc	agcattttga	ggtcacgggc	ctgcagtcat	accaytetya	1320
cgtggaggtg .	agcttcgagg	tatcgagcct	ggataaggct	gagcccttcg	atceggeeta	
cagcaacgac	gcgcagaagc	tctgcggcat	caagggcgcc	gatgtcaagg	acaaaaraaa	1380
gccttttggg	ctttgggtgc	tgtcctctgc	cgacctagca	gagaagactg	cagtgttctt	1440
cagagtette	aaggatggat	acggcaaacc	tatcgtcctc	atgtgcagcg	accccaccaa	1500
gtcatctctt	accccagatc	tatacaagcc	gactttcgcc	gggttcgtcg	acaccgacat	1560
ttcgtccggg	aagatctctc	tgagaagctt	gatcgatcgg	tcggtggttg	agagcttcgg	1620
cgcgggaggg	aagacctgca	tcctatcaag	ggtgtacccg	tctatggccc	tagggaaaga	1680
cgcgcacctt	cacatattca	acaacgggga	gacggatatc	aaggtgtcca	agctgaccgc	1740
gtgggagatg	aadadaccat	tgatgaatgg	cocctaaoca	tocaccatct	ccgacgagtt	1800
ttcgcttcct	cacatttcat	agtttcactt	cactgatatt	cagtgcctcg	attoctcact	1860
caagagctct	atratage	atrattoraa	atttattac	aaaattcato	ggttgggtac	1920
cgtggtgtac	atyaccacac	acgactgcaa	taatttccac	acctctaaat	ataataatga	1980
egregerac	glacaaalaa	agatattytt *******************************	taatttccac	acgeceaaae	acaacaacga	2010
agagctagct	Calallic	Ladadadaa				
010: 10						
<210> 18						
<211> 1389						
<212> DNA						
<212> DNA <213> Loliu	m perenne					
	m perenne					
<213> Loliu	_					
<213> Loliu <400> 18 agacatagaa	tccctqctqq	tgtaccggag	cgcggacttc	ctccgctggc	agcgcaacgc	60
<213> Loliu <400> 18 gggcgtgggg cgcgctg	tccctgctgg	cgcgggacgt	gcccgtgctg	ctccgctggc gagtgcccgg	acctgttccc	120
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg	tccctgctgg cacgccagct gcggcgcagg	cgcgggacgt gcgcgacgga	gcccgtgctg ggggctcgag	gagtgcccgg acttcggcac	acctgttccc cgagcggcgc	120 180
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg	tccctgctgg cacgccagct gcggcgcagg	cgcgggacgt gcgcgacgga	gcccgtgctg ggggctcgag	gagtgcccgg acttcggcac	acctgttccc cgagcggcgc	120
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg	tccctgctgg cacgccagct gcggcgcagg catgtgctca	cgcgggacgt gcgcgacgga agctcacgga	gcccgtgctg ggggctcgag cttcgccaag	gagtgcccgg acttcggcac gaggaccact	acctgttccc cgagcggcgc acatggttgg	120 180
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt	gcccgtgctg ggggctcgag cttcgccaag gccggcggag	gagtgcccgg acttcggcac gaggaccact cccgagcgcg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc	120 180 240
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cqccqgctcg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc	120 180 240 300
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc	120 180 240 300 360
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag caggggctgg	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cggcgcatac gccggcatac	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa	120 180 240 300 360 420 480
<213> Loliu<400> 18gggcgtggggcgcgccgctgggtggctgcgcggggtgagggttttacgaccgacaactgggcgcaacaagcaggggctgggcggctggtgggcggctggtgggcggctggtgg	tecetgetgg cacgccaget geggegeagg catgtgetca gacgtggetg egeeggeateg egeggeatec geeggeatec	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct	120 180 240 300 360 420 480 540
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg ggggtggtg	tecetgetgg caegecaget geggegeagg catgtgetca gaegtggegg egeeggeteg egeggeatee geeggeatee cagtggeegg acggaegtgg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgta aggcgttccc tggaggagat aggccggcgg	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg caggaaggag	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca	acctgftccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc	120 180 240 300 360 420 480 540
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtggtg gcggtggtg gcggtggtcg gcggtggcg gcggtggcg	tecetgetgg caegecaget geggegeagg catgtgetea gaegtggegg egeeggeteg eggegeatae geeggeatee cagtggeeg aeggaegtgg gtggaegtgg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg caggaaggag cccgaacctg	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga	120 180 240 300 360 420 480 540 600 660
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtggtg gcggtggtg ccggtggtg ccccgagtg	tccctgctgg cacgccaget geggcgcagg catgtgctca gacgtggcgg cgccggctcg cgcggcatac gccggcatac cagtggccg agtggaggtcg gtggaggtcg gtgcggatac	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgat gagggcgatg cgagaaggag ccggaaggag cccgaacctg gtgcgcggcg	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg	120 180 240 300 360 420 480 540 600 660 720
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag gcggctggt gcggtggtg gcggtggcg gcggtggtg gcggtggcg gcaggcggac ccccgagtgg cggctggtg	tccctgctgg cacgccaget geggcgcagg catgtgctca gacgtggcgg cgccggcatcg cgcggcatac gccggcatcc cagtggcccg acggacgtgg gtggaggtcg gtgctggatc ccgttcgggc	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaaggct tgctcgtctt	gcccgtgctg ggggctcgag cttcgccaag gccggcgag cctgtacgcg ggtggacgatg cgagacgctg cgagacgctg ccaggaaggag cccgaacctg gtgcgcggcg ggcctccggt	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa ggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc	120 180 240 300 360 420 480 540 600 660 720 780
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctggt gcggtggtg gcggtggcg gcaggcggt gcggtggcg ccccgagtg cggcgtcggc	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggcatac gccggcatac gccggcatac gcggcatac gcggacgtgg gtggaggtcg gtggaggtcg gtgctggatc ccgttcgggc agggtgttca	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgt aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg ccggaacctg gtgcgcggcg ggcctccggt caagtacaag	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aaggaggccg aagggcgcgt gacctggagg gttctcatgt	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct	120 180 240 300 360 420 480 540 600 660 720 780 840
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtgggc gcggtggcg gcggtggcg gcaggcggac ccccgagtgg cggcgtcggc cgcgtcggc cacaaagtca	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cggcgcatac gccggcatac gcggcgcatac gcggcgtgg acgtgggccg acggacgtcg gtggaggtcg gtgctggatc ccgttcgggc agggtgttca tctacgaaaq	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgt aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caqqqqcaca	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg ccggaacctg gtgcgcggcg ggcctccggt caagtacaag caagccatcc	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggagcat	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt	120 180 240 300 360 420 480 540 660 720 780 840 900
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctggt gcggtggcg gcggtggcg gcggtggcg ccccgagtgg cggcgtcggc tgttttc cacaaagtca	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cgcggcatac gccggcatac gcggcatac gcggcatac gcggtggccg acgtggccg acgtggccg acgtgaggtcg gtgtgggtgtcg gtgctgggc acgtcggcatac cagtcgaggaggtgtca tctacgaaag aaggacaagt	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg ccgaacctg gtgcgcgggg ggcctccgag ggcctccgag caagtacaag caagccatcc cagaacattg	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggagcat atcgatcaca	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggtga	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtgggcg gcggtggcg gcaggcggac ccccgagtgg cggcggctggc gcggttcttc cacaaagtca ggacgtggag ggacgtggag ggacgtcttc cacaagtca ggacgtggag ggacgtcttc	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cgcggcatac gccggcatac gcggcgcatac gcggcgtgg acggacgtcg gtggaggtcg gtgtggggt cgcttcggc acggtcgggc atgatgaggtcg gtgctgggc atgatgaggtcg gtgtgtgagg agggtgttca tctacgaaag aaggacaagt gacggcggga	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg ccgaacctg gtgcgcggg ggcctccggt caagtacaag caagccatcc cagaacattg gacggct	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggagcat atcgatcaca gtgtaccccg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggtgga aacacgcggc	120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctggtg gcggtgggcg gcggtggcg gcaggcggac ccccgagtgg cggcgtcggc tgtgtcttc cacaaagtca ggacgtggag gagcttcggc tgtgtcttc cacaagtca gacgtggag gagcttcggc gatggag gagcttcggc cgatggag gagcttcggc cgatggaag gagcttcggc gatggaag	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cgcggcatac gccggcatac gcggcatac gcggcgtgg gtggaggtcg gtggaggtcg gtgtgggtcg acgtcggtca acgtcggtca acgtcgatc ccgttcgggc atgtgttca tctacgaaag tagagaaagt gacggcgga acgcctgt	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acqtgtcaa	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg caggaaggag cccgaacctg gtgcgcggcg ggcctccggt caagtacaag caagccatcc cagaacattg gacggctcgt caaggccggc	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atggccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggagcat atcgatcaca gtgtaccccg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgggctc agacgttgga ccgtgcaccgg agcacactgc gcaccgatct ttcttgatgt cggtggtgga aacacgcggc aggtgtccaa	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctggtg gcggtgggcg gcaggcggcg ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc tgtgttcttc cacaagtca gacgtggag gagcttcggc acttgagqcg acttgagqcg acttgagqcg	tccctgctgg cacgccagct gcggcgcagg catgtgctca gacgtggcgg cgccggctcg cgcggcatac gccggcatac gcggcatac gcggcatac gcggtgggggggggg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgttcaa cgacggcggc	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg caggaacgctg ggcctccggt caagtacaag caagccatcc cagaacattg gacggctcgt caacgggac cagggctcgt caacgggaca cggacacgg	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atggcggca gagggcgcg aagggcgcgt gacctggagg gttctcatgt tatggagcat atcgatcaca gtgtaccccg ggtgccgtaa ggctcgctta	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcaccgg agcacactgc gcaccgatct ttcttgatgt cggtggtgga aacaccgcggc aggtgtccaa cacccgtcgt	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgacacaag cagggctggt gcggctggtg gcggtgggc gcaggcggac ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc attgaggcg acttgaggcg acttgaggcg acttgaggcg cgtcaaggcg	tecetgetgg cacgceaget geggegeagg catgtgetca gacgtggetcg cgceggeatec cagtggeccg acggacgtgg gtggaggtcg gtgetggatc ccgtteggge agggtgttca tetacgaaag aaggacaagt gacggegga accaccetgt tgggagetgg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgtcaa cgacggcgc aagaggcctt	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg cgagacgctg ccggaacgcg ggcctccggt caagtacaag caagacattcg gacggctcgt caagacatttg gacggctcgt caacgggaca cgtgaacggc gtagtttag	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct accgacggtg tggctggacg cggaggaagc atggccggca gagggcgcg gacctggagg gttctcatgt tatggagcat atggatcaca gtgtaccccg ggtgccgtaa ggctcgcttg ggtatgccccg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgactc agacgttgga ccgtgcaccg agcgttgga ccgtgcaccg gcaccgatct ttcttgatgt cggtggtgga aacaccgcgg agctgtcaa cacccgtcgt ggatggtccaa cacccgtcgt	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag caggggctgg gcggtggtg gcggtggcg ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc tgtgttcttc cacaagtca cgacgtggag cgcgtggag cgcgtggag cgtcggc tgtgttcttc cacaagtca ggacgtggag cacttagatg cgtcaaggcg cgtcaaggca tgcttagatg	tecetgetgg cacgccaget geggegeagg catgtgetca gacgtggegg cgccggetcg cgcggcatcc cagtggecg acggacgtgg gtggaggtcg gtggaggtcg gtgetggatc ccgttcgggc agggtgttca tctacgaaag aaggacaagt gacggcgga acccactgt tgggagetgg tccgaccta atgtccqtcq	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgte tgggggttcc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgttcaa cgacggcgcat acgacggcgct tgatttaat	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg caggaacgct gtgcgcggcg ggcctccggt caagtacaag caagccatcc cagaacattg gacggctcgt caacggaca cgtgaacgcg gtagtttag cttgttggtc	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct tcgcagcgtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggacat atcgatcaca ggtgccgtaa ggtgccgtaa ggtgccgtag ggttctcattg ggtatgcccg	acctyftccc cgagcggcgc acatggttgg gcgaccgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggga acaccgcggc agatgtccaa cacccgtcgt ggatggtggc ttcgggtagg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag caggggctgg gcggtggtg gcggtggcg ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc tgtgttcttc cacaagtca cgacgtggag cgcgtggag cgcgtggag cgtcggc tgtgttcttc cacaagtca ggacgtggag cacttagatg cgtcaaggcg cgtcaaggca tgcttagatg	tecetgetgg cacgccaget geggegeagg catgtgetca gacgtggegg cgccggetcg cgcggcatcc cagtggecg acggacgtgg gtggaggtcg gtggaggtcg gtgetggatc ccgttcgggc agggtgttca tctacgaaag aaggacaagt gacggcgga acccactgt tgggagetgg tccgaccta atgtccqtcq	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtc tggaggagat aggccggcgg tgttcgagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgttcaa cgacggcggc aagaggcct ttgatttatg	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gagggcgatg caggaacgct gtgcgcggcg ggcctccggt caagtacaag caagccatcc cagaacattg gacggctcgt caacggaca cgtgaacgcg gtagtttag cttgttggtc	gagtgcccgg actteggcac gaggaccact cccgagcgcg tccaagtcct tcgcagcgtg tggctggacg cggaggaagc atcgccggca gaggaggccg aagggcgcgt gacctggagg gttctcatgt tatggacat atcgatcaca ggtgccgtaa ggtgccgtaa ggtgccgtag ggttctcattg ggtatgcccg	acctyftccc cgagcggcgc acatggttgg gcgaccgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggga acaccgcggc agatgtccaa cacccgtcgt ggatggtggc ttcgggtagg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtgggt gcggtggcg ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc gatggaag cgtcggc tgttcttc cacaaagtca ggacgtggag cgtcagag cgtcggc tgtttttc cacaaagtca ggacgtggag gagcttcggc gatggaag cgttagag cgttagagca ctttagagca tgttagatg gatgatttt	tecetgetgg caegecaget geggegeagg catgtgetca gaegtggegg egeeggeteg egeggeatee geggegeatee geggegeatee geggegeatee aegtggeeg gtgaggteg gtgetggate eegtteggge agggtgttea tetaegaaag aaggaeagtg gaeggegga acceacetgt tgggagetg teggagetg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgtcaa cgacggcgg tgttcaa cgacggcgcat tcatatcgct tgactttaa	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gaggacgatg caggaacgctg gtgcgcggcg gcctccggt caagtacaag caggacatcc cagaacattg gacggctcgt caacgggaca cgtgaacgg gctgtcatgac cgtgaacgt catgttagtc	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct tcgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccgt gacctggagg gttctcatgt tatggagcat atcgatcaca ggtgccgtaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggttatcccg ggtatgccgtaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggttatgccg	acctgttccc cgagcggcgc acatggttgg gcgacgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggga aacaccgcgca agcaccgtcgt ggatggtgga acaccgtcgt ggatggtgga acaccgtcgt ggatggtggc tttcgggtag aacaccgtcgt agatgttcga	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
<213> Loliu <400> 18 gggcgtgggg cgcgccgctg ggtggctgcg cggggtgagg gttttacgac cgacaactgg gcgcaacaag cagggctgg gcggtgggt gcggtggcg ccccgagtgg cggcgtcggc tgtgttcttc cacaaagtca ggacgtggag gagcttcggc gatggaag cgtcggc tgttcttc cacaaagtca ggacgtggag cgtcagag cgtcggc tgtttttc cacaaagtca ggacgtggag gagcttcggc gatggaag cgttagag cgttagagca ctttagagca tgttagatg gatgatttt	tecetgetgg caegecaget geggegeagg catgtgetca gaegtggegg egeeggeteg egeggeatee geggegeatee geggegeatee geggegeatee aegtggeeg gtgaggteg gtgetggate eegtteggge agggtgttea tetaegaaag aaggaeagtg gaeggegga acceacetgt tgggagetg teggagetg	cgcgggacgt gcgcgacgga agctcacgga acaccttcgt accacggcca tgtgggcgtg aggcgttccc tggaggagat cgaaagggct tgctcgtctt agcacgatgg caggggcaca tcatatcgct ggacgtgcat acgtgtcaa cgacggcgg tgttcaa cgacggcgcat tcatatcgct tgactttaa	gcccgtgctg ggggctcgag cttcgccaag gccggcggag cctgtacgcg ggtggacgag gaggacgatg caggaacgctg gtgcgcggcg gcctccggt caagtacaag caggacatcc cagaacattg gacggctcgt caacgggaca cgtgaacgg gctgtcatgac cgtgaacgt catgttagtc	gagtgcccgg acttcggcac gaggaccact cccgagcgcg tccaagtcct tcgacggtg tggctggacg cggaggaagc atcgccggca gaggaggccgt gacctggagg gttctcatgt tatggagcat atcgatcaca ggtgccgtaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggttatcccg ggtatgccgtaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggctcgctaa ggttatgccg	acctyftccc cgagcggcgc acatggttgg gcgaccgaccc tctacgacgc gcggcgtcgc ccgacgggaa gggtcggcct tcgtgagctc agacgttgga ccgtgcacgg agcacactgc gcaccgatct ttcttgatgt cggtggga acaccgcggc agatgtccaa cacccgtcgt ggatggtggc ttcgggtagg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1140 1200 1260 1320

```
<210> 19
<211> 2231
<212> DNA
<213> Festuca arundinacea
<400> 19
gctgtccact gcctctcgtc ccacccgctc tctctgttgc taagttggtt ggtttgccat
                                                                       60
ggcgggcctc cgtctcgccg cgtgcgcggc cgtcgccgtg ctactctgcc tcctcctct
                                                                      120
gtcctccgcc gccctccgat ggctctctga ccccgcgcct gagagcgccg ccgccggagt
                                                                      180
cagccacgac agetaccgga ccgcctacca cttccagccc acggagaact ggcagaacga
                                                                      240
                                                                      300
tccgaatggg ccgatgtatt acaagggcgt ctaccacttc ttctaccagt acaacccgta
ccgcgcgacc tggggcaacg gcaacctete ctggggtcae tccgteteeg tcgacctegt
                                                                      360
                                                                      420
aaactggtcc gccctcgaga acgccatgga cccggactcc tccttcgaca tcaacggctg
                                                                      480
ctggtcgggc tccgccacca tactccccga cggcaccccg gtcttcctct acaccggcat
cgacgccgac aacaaccagg tccagaacgt ggccttcccc aagaacgcct ccgacccgct
                                                                      540
                                                                      600
cctccgcgag tgggtgaagc ccagctacaa ccccgtcatc gcgctccccg acgacgtcgt
gcacgacaac ttccgggacc cctccacggc ctggctcggc cgcgacggcc tctggcgcgt
                                                                      660
cgccgtctcc gcagggctca aggacggcac ggggaccacg ctggtctacc gcagcaagga
                                                                      720
                                                                      780
cttccggcag tgggagcgca acgccgagcc gctctactcg tcgagcgacg ccggcatggt
                                                                      840
ggagtgcccg gacctgttcc ccctggcgga gcccggcgac cagcacgggc tcgactacac
                                                                      900
gccctcgaac ggcgcggcgg tgagttatgt gctgaagcag agcgttatgg acacgctcag
tgactactac gtgctggggc ggtacgacga cgccgcggac accttctcgc cggtggaggc
                                                                      960
                                                                     1020
ggacaacgac tgccggacat ggcagcgctt cgactacggc cacgtctacg cgtccaagtc
                                                                     1080
cttctacgac gcgggcaaga agcggcgcgt gctctggagc tgggccaacg agtccgaccc
                                                                      1140
cgaggccgac tacctcgcca ggggctgggc cggcgtgcag gccgtcccga ggaggatctg
                                                                     1200
gctggacagc aaggggaagc agctgctgca gtggccgatc gaggagatcg agacgttgag
                                                                     1260
gaagacgcgg gtcgggttgc tgggagcgga gatgaacgcc ggcggcatga acgagatcat
cggcgtcgcc ggcgcgcagg cggacgtgga ggtggtcttc gaggtcccgt ccctggaggg
                                                                     1.320
                                                                      1380
cgccgagaac ctcgacccca accagctgct tgacccacag aggttgtgcg gcgagaaggg
cgcgtccgtg cttggcggcg tcggcccgtt cgggctgctc gttctggcct ccggcgacct
                                                                      1440
                                                                      1500
ccaggagcac acctccgtct tcttcagagt gttcaggcac gagggcaagt acaaggttct
                                                                      1560
catqtqcacc gacctcagaa gatcgactac gagagccgac gtgtacaagc cgccgtacgg
agggttcgtg gacatcgaca tcgagaagga gaggagcata tcgctcagga cactggtcga
                                                                      1620
                                                                      1680
ccacteggtg gtggagaget aeggeggegg eggeeggaeg gteateaegg egegggtgta
                                                                      1740
cccggagcac gcggcgacga ccaacagccg cctgttcatg ttcaacaatg gcaccggcgc
cgtgaaggtg tccaagctcg atgcgtggga gctggcgccg gcgaaagtga acgtcccggg
                                                                      1800
                                                                      1860
cgacgggctc atcaccgctg gctcctcgat gcacctacgc gaagcgtatt aggaggagat
tgtgattagt agttcgttcg gtgaatggcc aattgtgtgg ccgattggac ttccctggcc
                                                                      1920
aaattacggt cttttggggg ttcatttggg gaatttgtag cagtgtcttt caggatagta
                                                                      1980
                                                                      2040
aagtacagta gtacgtagta agaagggtag tcgaagtctc gaagagcgtt ttgctgattt
                                                                      2100
gggatgcatt tgggagattt gtttagtact gcatgtcagc gattgtgagt agtatctgtc
                                                                      2160
aggatagtat ataagtagta agaaagaaga gtagtcgaag agtggttgct gattaacaca
tgtcagcgaa cagtccgcgt cttgtttatt ctttgcaaaa gaaatagaga aagtacatat
                                                                      2220
                                                                      2231
савававава в
<210> 20
<211> 1319
<212> DNA
<213> Festuca arundinacea
<400> 20
cttgaactca actgagttca gggatccgac aactggttgg atcggaccgg atgggctatg
                                                                        60
gagaatagca attggtgctg agctgaatgg ctacggtgcc gcacttttgt acaagagtga
                                                                       120
agactttctg aattggacta gagttgatca cccactgtat tcagacaatg ccccctcaat
                                                                       180
                                                                       240
qtqqqaqtqc ccaqatttct tcqccqtatt qccaqqcaat aacqqtqqac tqqacctqtc
tgcggcgatc ccgaaaggcg ccaaacatgt cctcaagatg agcgtggatt actctgacaa
                                                                       300
gtacatgatt ggggtttatg atctcaaacg tgatgccttt gttccggatg ttgtcctaga
                                                                       360
tgaccgtcgg ctgtggttga ggattgatta cggcacattc tatgcttcaa aatccttctt
                                                                       420
cgactcgaaa aggggcagga gggtcatatg gggttggtcc aacgagacag atagtgtttc
                                                                       480
                                                                       540
agatqatqqt qcaaaaqqtt qqqcaqqtat ccatgcaatc cccaggtcaa tttggttaga
cagcgatggc aaacagttgc tgcaatggcc gattgatgag attgagtccc ttcgaagaga
                                                                       600
tgaaatcaac catcaaggac tagagctgaa gaacggagac ctatttgaga ttaagggaat
                                                                       660
tgacactttg caggctgata ttgaagtaga ttttgagctg acgtccatcg acagcgccga
                                                                       720
tccttttgat ccttcctggc ttttggatgt cgagaggcat tgccgggaag caggtgcatc
                                                                       780
ggttcaaggt ggcatagggc catttggact tgttgtcctg gcgtctgaca acatggagga
                                                                       840
gcacattgct gtgcacttca gagtttacaa atcacagaaa agccacatga tcctcatgtg
                                                                       900
```

ctctgatcta	agaaggtctt	ctctgagatc	aggactgtac	acaccagcct	atggaggctt	960
ctttgaattt	gaccttgaaa	aggaaaggaa	gatatctctc	agaactctga	ttgatcggtc	1020
agcaataaaa	agctttggcg	gcggtggcag	ggtctgcata	acggccagga	tttatccagt	1080
aacacttatc	gacggcaggg	tccacatgta	tgccttcaac	aatggaagta	ccacggtcag	1140
ggtgccacaa	ctcggggcat	ggagcatgat	gacagcacaa	gtgaacgtga	ataagggttg	1200
aagtgatggt	taacacagaa	gagcagtttc	attttcttaa	ttagcgtact	ctcattcagg	1260
agcactcctt	ggtacaattg	aaaggaaatt	cgacaggaag	tagttggtca	aaaaaaaa	1319
		•				
<210> 21						
<211> 1995						
<212> DNA						
<213> Festi	ıca arundina	icea				
<100> 01						
<400> 21	taataactgc	acaaacaata	aaaatccaa	aatggatctt	cacaccataa	60
ggtetteeae	tgctcttcct	gcaagcaatg	acctacacat	ctcaccatac	ccaccaaaac	120
geggtgette	aggccgcgtc	gagataagta	ccaccttcca	ttattaggg	actactcaaa	180
ciggagaccg	acttccagcc	ccccatcaac	tagatcaaca	atccaaatgg	gccattgtac	240
tagggetate	ggtaccacct	attctaccaa	tacaacccca	aggaaggagt	gtggggcaac	300
atcatgtgcc	cgcactcggt	atcccacaac	ctcatcaact	ggatcgccct	ggagccggcg	360
atcacccggg	gcatcccgac	ggacaagtac	aacatataat	ccaattcaac	gacgatcctc	420
caccaccaca	cgccggcgat	cctotacaco	gggatcgacc	ggccgagcat	caactaccag	480
atccadaaca	tegegetgee	caagaacgcg	tcggacccgc	tecteeggga	atggtacaag	540
cctagataca	acccgatcgc	cataccaata	gccggcatga	acgcgacgca	gttccgcgac	600
ccdaccaccd	cgtggttcgc	cadcadacac	tggcggatgc	tggtggggg	cctccggccg	660
gagacactcc	gcggggaggc	gatcctgtac	cggagcctcg	acttcaagaa	ctggacccgc	720
gcccaccacc	cgctgcactc	ggcgctgacc	ggcatgtggg	agtgcccgga	cttcttcccg	780
ataaacaaaa	ccaaaataaa	gaagggcctg	gacacctccg	agcacggtga	aggggtggag	840
aagcacgtgc	tgaagaacag	cctcgacctc	acccgctacg	actactacac	cgtcggcacg	900
tacgacaacg	tcaaggagcg	gtacgtgccg	gacaacccca	ccggcgacgt	ctaccggcgc	960
ctccagtacg	actacggcaa	cttctacgcg	tccaagacct	tcttcgaccc	cgtgaagcag	1020
caccadatcc	tcctggggtg	ggccaacgag	tccgacagcg	tggcccacga	caaggccaag	1080
aactaaacca	ggatccaggc	gattcccagg	aagatatggc	ttgaccccag	cggcaagcag	1140
ctaatacaat	ggccggtgga	ggagctggag	aagctccggg	gcaagcctgt	caccgtcggc	1200
gacaaggtcg	tcaagcccgg	ccagcatttt	gaggtcacgg	ggctgcagtc	ataccagtct	1260
gacgtggagg	tgagcttcga	ggtgtcgagc	ctggataagg	ccgagccgtt	cgatccggcc	1320
tacagcaacg	acqcqcagaa	gctgtgcggg	atcaagggcg	ccgatgccaa	tggcggggtg	1380
gggccttttg	ggctcgtggt	gctggcctct	gccgacctgg	cagagaagac	tgcagtgttc	1440
ttcagagtct	tcaaggatgg	atacggcaaa	cccatcgtcc	tcatgtgcag	cgaccccacc	1500
aagtcatctc	tcaccccaga	tctatacaag	ccgactttcg	ccgggttcgt	cgacaccgac	1560
atttcatccg	ggaagatctc	cctaagaagc	ttgattgacc	ggtcggtggt	tgagagette	1620
ggcgcgggag	ggaaaacctg	catcctgtca	agagtgtacc	cgtccatggc	cctagggaaa	1680 1740
aatgcgcacc	ttcacgtgtt	caacaacggg	gagacggata	teaaggtgte	caagetgaee	1800
gtgtgggaga	tgaagagacc	cttgatgaat	ggcgcctaag	ttangtaccat	ccccyacaay	1860
ttttcggttt	ctcgcatttt	grggrrrrag	nanttttatt	ggaaaattga	taaattaaat	1920
ctcaggaget	ctatgatcag gtatgtacaa	atacgattgc	tatttaattt	ccacacttct	aaatataata	1980
		ataaagatgt	cyccaacca	coacgettet	dadededada	1995
gtaacaaaaa	aaaaa					
<210> 22						
<211> 1760						
<212> DNA						
	um perenne					
	.				•	
<400> 22						
ggatggcttg	gtgacctttg	gaattctccg	gcaacacaaa	agatccaaat	ggaccaatgt	60
actacaatqq	r tatctaccat	gagttctacc	: agtacaacco	: caatggctcc	ctctggggta	120
acataattto	gggccattca	gtttcgacgg	acctcatcaa	ı ctggatccca	. gtagaacctg	180
cgatagaacg	ggatatccca	agtgacataa	. acggttgctc	, gaccggctca	gccacaatta	240
tttccggtga	tcaaccaatt	atcatataca	ccggagccga	caaggagaac	cgtcagctcc	300
agaacattgt	gcttcccaaa	aacaagtctc	acccgtatct	gagggagtgg	acaaaagcag	360
gtaataacco	ggtgatccaa	ccagtcgggc	: caggcttgaa	tgcgagccag	ttcagggatc	420
cgacaaccgg	, ttggattgga	ccggatggac	: tgtggaggat	. agcagttggt	. gctgagctta	480
atggctacgg	tgctgcactt	ttgtacaaga	gccaagactt	. cougaattgg	tttttagagilg	540 600
atcacccgct	gtattcatco g aaatagtggt	aatgcatcct	. caacycygga . tatotooso	a aatoccasat	. dacaccasac	660
tattgccggg	, aaatagtggt	. ggacttgacc	. Latetycaya	. aaccccaad	. ggcgccaage	000

atgtcctcaa aatgag	ccta gattcctgtg	acaagtacat	gatcggagtt	tatgatctga	720
aaagtgatac ctttat	gcca gatagtgtgt	tagatgaccg	tcgactgtgg	tcgaggatcg	780
atcatggcaa tttcta	tgct tcaaagtcat	tcttcgactc	gaaaaaggga	aggaggatca	840
tatggggttg gacaaa	tgag acagatagct	cttcagatga	tgttgcaaaa	ggttgggctg	900
gaatccatgc aattcc	cagg acaatatggt	tagacagtta	tggcaagcag	ttgctgcaat	960
ggccaattga agagat	cgag tcccttcgaa	gaaatgaaat	cagccatcaa	ggactagagc	1020
tgaagaaagg agacct	attt gagattaaag	gaactgacac	ttcgcaggtg	gtccatgttt	1080 1140
ttttagggaa actgta	agett atetggeaca	tcattttctt	gaaacaggct	gatgtggagg	1200
tagattttga gctgad	catcc attgataatg	ccgacccttt	rgatectice	aggeriety	1260
atgtcgagaa gcagtg	recga gaageaggig	categgilea	tactatacac	ttcacacttt	1320
gacttgttgt cttggc acaaatcgca gcaaag	retac atmatestca	tatattata	tctaagaagg	tetteeetga	1380
gatcaggaat gtacac	racca gratatogad	acttettaa	atttgacctt	cagaaggaaa	1440
gaaagatatc tctgag	raact ctgattgatc	gatcaacaat	ggagagcttc	ggaggcggtg	1500
gcagggtctg catcat	ggcc agagtttatc	caataatact	tgtcgatgat	ggcggggccc	1560
acatgtacgc cttcae	acaat ggcagtacca	cggtcagggt	gccacagctc	agggcatgga	1620
qcatqagcag ggcaga	agcac aagtgaatgt	aaagttaaag	tgatgattaa	catagaagag	1680
caaatctaat tgacct	gtga ttggaggact	ggaaaagtga	tttaaatgct	tagcacaatt	1740
gtttcttgat aaaaa			•		1760
				•	
<210> 23					
<211> 2059 <212> DNA					
<213> Festuca ar	ındinacea				
\213\\ 1\edge{caca} \ a10	anamaca				
<400> 23					
ggaaccagcc accca	cctgg ccatccatgg	ccgggctccg	tctcgccgcg	gtcgccttcc	60
acctctgcct cctgc	tctct ccgtcgtcct	ccctccgccg	gctctaccac	gaggacgacg	120
aggcagagag cacgc	caggc catggcggga	gcaggaccgc	ctaccacttc	caacccgcca	180
agaactggca gaacg	atccg aatgggccga	tgtaccacaa	cggcttgtac	cacttgttct	240 300
accagtacaa cccac	gtggc gccacctggg	gcaacggcaa	ceteteetgg	ggedaeteeg	360
tgtccgtcga cctcg	ceaac tgggcegeec cataa taggaataa	ccaccatcct	ccccgatgga	caaccaacca	420
ttctctacac cggca	tease accactages	accadatcca	aaacgtcgcc	ttccccaaga	480
aggcatccga tccac	teett eataaataaa	tgaagcctga	ctacaacccc	gtcattcctc	540
tccccaagga cgtcg	tocac gacagettee	gtgacccctc	cacggcgtgg	cgcggccgtg	600
acggcctctg gcgtg	tggcc atcgcggcca	aggtcaacgt	gaccgtgacc	gtggggtcaa	660
cactgatcta ccgga	gcaag gacttccggc	gctgggagag	gaacgccgcg	ccgctgtacg	720
agtctcttgc cgccg	gcatg gtggagtgcc	cggacctgtt	cccggtggcg	aagcccggtg	780
cgcagaacgg gctcg	actac gcgccctcga	gcagggcggc	gaggcacgtg	ctgaagctga	840
gcgtggtggc cacgc	tccag gactactacg	tggtggggct	gtacgacgac	actgcggaca	900
ccttcaatgc ggccg	ccggc gccgacaacg	actggcggac	ctggcgccgc	atcgactacg	960 1020
gccacgtgta cgcgt	ccaag teettetteg	acgegegaaa	gaaccggcgc	tetageatee	1020
gctgggccaa cgagt agacggtccc gagga	etgae acegaggeeg	togatogo	acaactacta	cartraccaa	1140
tcaaggagat agaga	agate eggetggaea cacta aggaagaaac	. ccgacgggaa : gaatcaaatt	gctaggagg	gagatgaact	1200
ctggcggcct gaacg	agate atequested	caaactcaca	gacagacata	gaggtcgtct	1260
tcaagatccc gaccc	tagaa agaactgaga	acattgagcc	caatgagcta	ttggacccgc	1320
aaaagctatg cggca	acaat ggcgcgtcaa	tgcggggcag	tatcggcccg	ttcggtctac	1380
tectectage etceg	gcgac ctgctggagc	: acacctcagt	cttcttcagg	gtgttcaagc	1440
acggtgccaa gtaca	aggtt ctcatgtgca	. ccgacctcac	aagatcgact	acgagatccg	1500
acqtqtacaa qccqt	catac agaggattco	r tggacatgga	catcgacaag	accaagagca	1560
tatcgctcag aacat	tgatt gatcactctg	tggtggagag	cttcggcggt	ggggggcgaa	1620
cgtgcatcac ggcgc	gggtg tacccggagc	acgcggagat	gagcaacagc	cacalctata	1680 1740
tgttcaacaa tggga	cagge geggtgaage	cagecaaget	cgaggcgtgg	atantontas	1800
cagccaacgt gaatg	tegeg ggecaegggt	. yalaacccca . actotoooo	ayiycaaiga ctactacett	ttattctcca	1860
aaactatata tgcca	cttat ataactactt	actycygydg aattaddata	tacttatace	aaaaaaaatc	1920
ttcaaaaatt ggtcc	aadtt aaadttaaa	. acaatacccc	cgacatacac	attcctctqc	1980
seculation gypto	aagee aaageegggg	, ,-,,-,-	. 5	_	

atatgcttgt aacgtgggt taggcataaa aaaaaaaa		taagtacgcg	ggactttgtg	attctcgcca	2040 2059
<210> 24 <211> 2167 <212> DNA					
<213> Lolium perenn	9				
<400> 24 gggaccttgc gcccaagt	ac gtagtctgca	cagcaatggg	ggttcgtctc	gggagagtag	60
cttgggcgtg cccggcgg	tt ctggtgctgc	tcttgcagct	cgccggagcg	tcccatgtcg	120 180
tctacgagac cagcctcc ttgagctgag caccgggt	tc gagacegagg ac cactteegge	ctcagaagaa	caccgracca	gateccaacq	240
cgccgctgta ctacaagg	gt tggtaccatc	tgttcttcca	gtacaacccc	aagggcgcgg	300
tgtggggcaa catcgtgt tggagacggc cctggcgc	gg gcgcactcgg	tgtcgcgcga	cctcatcaac	tgggtggccc	360 420
cgaccatcat gcccgacg	gc agcategatga gc acgccggtga	tcatgtacac	gggcgtcagc	cggccggacg	480
tcaactacga ggtccaga	ac gtcgccttcc	ccaagaacag	ctcggaccct	ctcctccggg	540
agtgggtgaa gccggcgc agttccggga cccgacca	ac aacccggtga	tcgtcccgga	gggcggcatc	aacgcgacgc	600 660
ccctctccgg cgcgtccc	ac gacataacat	acgtgtaccg	gagccgcgac	ttccggcggt	720
ggacgcgggt gcggaagc	cg ctgcactcgg	cgccgacggg	gatgtgggag	tgcccggact	780
tctacccggt gaccgtgg cgagggtgaa gcacgtgc	ac ggcaaggaga	gcggggtgga	cacgtccgtg	gtgtccagct	840 900
togggacota ogacoggo	tg aaggagaggt	acgtgccgga	caaccccgcc	ggcgacaagc	960
accacctgag gtacgact	ac ggcaacttct	acgcgtccaa	gacgttctac	gacccgtcca	1020
agcgccgccg catcctgt ccaagggctg ggccggaa	gg ggatgggcga	acgagtccga	ttagctagac	gacgacgtcg	1080 1140
ggcagctgat gcagtggc	cg gtggaggagg	tgaaggcgct	cagggggaag	aagccggtca	1200
gcctcaagga ccggatgg	tg aagcggggag	aacacgtcga	ggtcaccggg	ctacaaaccg	1260
cacaggetga egtegagg acceggeget ggeeaacg	tg agcttcgagg	tgccgagcct	ggaggggggg	gaggcgctgg	1320 1380
gcggcgtggg gcccttcg	gt ctgtgggtgc	tggcgtcgtc	caagctggag	gagaggaccg	1440
ccgtcttctt cagggtgt	tc aaggccgcgg	gcaacgtcaa	cagcaccaag	cccctcgtgc	1500
tcatgtgctc cgatccaa cgggcttcgt tgatattg	cc aagtcatctc	tgaacaagaa	tctcagaage	ctgatcgatc	1560 1620
aatccgtcgt ggagagct	tt ggggccggag	gcaggacgtg	catcctctct	cgcgtctacc	1680
cgtcgctcgc cattggca	gg aacgctcacc	tccacgtctt	caacaacggc	aaggcggaca	1740
tcaaggtgtc gcggctca agatttagat tcaggcag	.cg gcgtgggaaa	tgaagaagcc	ggcgctcatg	ttgaatttgg	1800 1860
ctcaggcatg cgtctggg	gc gttattctga	tgttaatttg	acctctggtg	aaacatgcta	1920
gttttacaag ggcgcgta	.cg tagctagcta	ggtttgcacg	ctgtgtaagt	gaagggggtc	1980
attttgtatg cccccggg aaagttattt ttttgaaa	aa taataaagat co oogcaaaata	tttgctccaa	tcaactactc	ctagcataga	2040 2100
ttaaaataag gagcaaca	aa gtagaagttt	tacaagaaag	ttaatgtttt	gattattaaa	2160
aaaaaaa					2167
<210> 25					
<211> 2138 <212> DNA					
<213> Lolium perenn	ie				
<400> 25					
gccctcgcac tagtcggc	cg aggcattctt	cctagttgct	tccatcgcat	cgatctcgat	60
ccacagattc tatgccaa	itg gaggcaagag	atggcgtctc	gatgccctac	tcgtatgcgg	120
ccctgccgga ggacgccg tcgcagcgtt gctgttga	gag gcagcggtgg	ttgggcgcgg	tegeeggaee	gggcctctgt	180 240
tcaggctcgt tggcgagc	tg cctgccgggg	gcgtcgtcat	gcccaaccac	ccgatggaag	300
tcatggacgt cagcggta	igc agagggcctg	agtcaggcgt	gtcggagaag	acgtccgggg	360
ccgccagcga gagcggcg gcaatgcgat gctccagt	gc atgctgggcg	ccgacgccgg	cagcaacgcg	trecegraga	420 480
tgaacgaccc caacggto	eg gtctactaca	aggggtggta	ccacctcttc	taccagtaca	540
acceggaggg egeaatet	gg ggcaacaaga	tcgcgtgggg	ccatgccgtg	tcccgggaca	600
tgctccggtg gcgccacc gcgcatggtc aggctccg	tg cccatcgcca	tgttccccga	catcatcata	gacatcaacg ctctacacgg	660 720
gctccaccaa cgcctcc	itg caggtgered	geetegeett	cccctccgac	ccctccgacc	780
-	353-	· ·			•

cgctgctcac tcggggagaa	ggacttccgg	gacccgacca	ctgcatggta	cgatggctcc	gatggaatgt	840 900
ggcggatcgt	catcgggtcc	aaggataacc	gccgcgccgg	catggccttg	acctacaaga	960 1020
ccaagaactt ggatgtggga	ccatgatttt	ttataccca	ttaacaacac	gcaccgggtg	gacatgacgg	1080
aggccgttgc	ggcggcatcc	aacagcggtg	gtggtgaagt	tttgcatgtc	atgaaggaga	1140
gctcagacga	cgaccgacat	gactactacg	cgctagggag	gtacgatgca	gcgacaaaca	1200
agtggacacc	gctagatgcc	gacgccgatg	tcggcatcgg	gctgaggtac	gattggggaa	1260
agttctacgc	atccaagacc	ttctatgacc	cggccaagaa	gaggcgtgtg	tccctacagt	1320 1380
gggteggega	caccataata	gagcgcgccg ctagatacca	acgragacaa	caaccttatc	cagtggccgg	1440
tgatcaaggt	ggagacgctc	cgtaccaact	ccaccaatct	cgggagcatc	atcgtcgagc	1500
atggctccgt	cttccctctc	agtctccacc	gggccacaca	gctcgacatc	gaggcttcct	1560
tccacctaga	cccqctcqat	gtcgccgccg	caaaggaggc	cgacgttggc	tacaactgca	1620 1680
gcaccagcgg	tggcgcggcc	ggtcgtggag	cgctcggtcc	ctttggcctg	tacatcaca	1740
ccgatgccag	tagcaaccta	ggggacacgg cgcacgcact	tctgccatga	cgagtcaccg	tcatcccata	1800
ccaacgacat	tgtcaaaagg	gtcgttggca	acatcgtgcc	agtgctcgac	ggaaaggcgc	1860
tgtctgttag	ggttttggtg	gcccactcca	ttgtcgagag	cttcgcacag	ggtgggaggt	1920
cggtggtgac	ttcacgagtt	tacccgactg	aggccatcta	cgccaatgcc	ggggtatacc	1980
ttttcaacaa	cgccaccggt	gcccgggtcc	ccgccaccag	tctcgtcgtc	cataaaatgg	2040
acccctccta	caaccagaac	caggccgaaa	tggcttcatt	gtaaatcgaa	aatgtacata	2100 2138
ttgttttttg	tgctagcatg	ttgcccgtaa	aaaaaaa			2100
<210> 26						
<211> 1768						
<212> DNA					•	
<213> Loliu	m perenne					
<400> 26						
ggtccattgg	cgccacctcc	cgctcgccat	ggtgcccgac	caatggtacg	acatcaacgg	60
tgtctggaca	ggctccgcca	ccgtgttccc	cgatgggacc	ctgaacatgc	tctacacggg	120
gtccaccaat	geeteegtge	aggcccagtg	cctcgccgtg	cccgaggacc	caccaggat	180 240
cctcctccgc	aactggacca	agcacgaagc acccaaccac	cacataatte	gacgagtctg	accagacgtg	300
acacaccatc	atcoogtcca	aggacaacaa	cddccacdcc	ggcatcgcca	tggtgtacaa	360
gaccaaagac	ttcctcaact	acgagctcat	cccgggatac	ttgcatcgcg	tcgacggcac	420
cggcatgtgg	gagtgcatcg	acttctaccc	cgtcggcggc	aagaacggca	gcgaggagct	480
gtacgtgatc	aaggagagca	gcgacgacga	ccgacatgac	tggtacacgc	tagggaaata	540
cgacgcggca	gccaacacgt	tcacggccgc	ggacccggag	tacgacctag	ggattgggct	600 660
gaggtacgac	tggggcaagt	tctacgcgtc ttggcgagac	caagaccttc	cacaccasta	tcaccaagag	720
atgggcatcc	ctcatgtcga	ttccgaggac	gatagaactc	gacgagaaga	cctggaccaa	780
cctcatccaa	tggccagtgg	aggagatcga	gaccctccgc	atcaagtcca	ccgaccttgg	840
tggcatcacc	attgaccacg	gcagcgtcta	cccactccct	ctccaccgcg	ccacacagct	900
agacatcgag	gcctccttcc	gcctcgacgc	cgccaccgtc	gccgccctca	acgaggctga	960
cgtaggctac	aattgcagca	ccagcggcgg	ctctacccac	cgcggcgcac	teggeceell	1020 1080
tggcatcctc	gtccttgccg	acggtaaggc tcgagaccca	ggagcaaacg	geggegeace	gatcgacgct	1140
gaccaaggat	gacggggccc	gagtggtggg	atacaccata	cctatcctca	atggtgaggc	1200
attttccgtg	agggtgctcg	tggaccactc	aattgtggag	agcttcgcca	tgggtggaag	1260
atccacaaca	acgtcgaggg	tgtacccgac	ggagtctatc	tacggcgctg	ctggtgcata	1320
tcttttcaac	aatgccaccg	gcggctccgt	gaccgttgag	aagctcgtgg	tgcatgagat	1380
ggactcgtcc	tacaaccaga	tcttcatggc	tgacgacttg	tagtcaccgt	taataaaaa	1440 1500
tagcgtcgga	tggtgaggat	gatcacctac tggcttcctc	ttttttaca	tacacacaca	gatogadeg	1560
tagctactct	atttaccato	ttgttgttt	attaatttt	taaaatttaa	gtttttgacg	1620
agatggatga	attagctata	gatggatgat	tgtgtcctat	ttttctcctg	ccttccgagt	1680
gtaactacat	atattggcag	gatcgatgat	atccctgttg	catgacagtg	atgattaatt	1740
attgtgatga	tattgatcaa	aaaaaaa				1768

```
<210> 27
<211> 1855
<212> DNA
<213> Lolium perenne
<400> 27
ggatcttccg gtccaggctc ccggacatcg acatccctac ccacatgccc ctgcacgact
                                                                       60
                                                                      120
actgcttcgc gacggcagcc tcggccccgg acgcgccgtg cctcattacc gcagccacgg
                                                                      180
ggcggaccta cacgttcgcc gagacgcacc tgctctgccg caaggccgcg gcggcgctgc
acgggctcgg cgtgcgccac ggggaccgga tcatggtgct gctgcagaac tccgtggagt
                                                                      240
                                                                      300
tegegetege ettettegge gegteeatge teggggeegt cageaeggeg gegaaceegt
                                                                      360
tctgcacgcc gcaggagatc cacaagcagc tcgtggcctc cggcgcgaag ctggtcgtca
cgcagtccgc ctacgtcgac aagctccggc acgaggcctt cccacgaatc ggcgaggccc
                                                                      420
                                                                      480
tgaccgtgat caccatcgac gacgacggca ccccggacgg ctgccagccg ttctggggcc
tcgtgtcagc cgccgacgag aacagcgtcc cggagtctcc catctcgccg gacgacgcgg
                                                                      540
                                                                      600
tggcgctgcc ctactcgtcg ggcacgacgg ggctgcccaa gggcgtggtg ctgacgcacg
ggggcctggt gtcgagcgtg gcgcagcagg tggacggcga gaacccgaac ctgcacatgc
                                                                      660
gggcggggga ggacgtggtg ctctgcgtgc tgccgctctt ccacatcttc tcgctcaact
                                                                      720
                                                                      780
cggtgctgct gtgcgcgctg cgggcgggcg ccgccgtgat gctgatgcct aggttcgaga
tgggggccat gctggagggc atcgagcggt ggcgcgtcac ggtggcggcc gtggtgccgc
                                                                      840
                                                                      900
cqctqgtqct cgcgctcgcc aagaaccccg gggtggagaa gcacgacctc agctccattc
                                                                      960
ggatcgtgct ctccggcgcc gcgccgctcg gcaaggagct cgaggacgcg ctacgtggcc
gcctgccgca ggccatcttc ggacagggct acgggatgac ggaggccggg ccggtgctgt
                                                                     1020
                                                                     1080
ccatgtgccc ggcgttcgcg cgggagccga cgccggccaa gtccggctcc tgcggcacgg
tggtgcgcaa cgccgagctc aaggtggtcg accccgacac cggcgtctcc ctcggccgca
                                                                     1140
                                                                     1200
acctccccgg cgagatctgc atccgcggcc cgcagatcat gaaaggatac ttgaatgatc
                                                                     1260
ccgtggccac cgccgcgacc atcgacgtcg agggatggct ccacaccggc gacatcggct
acgtcgacga cgacgacgag gtcttcatcg tcgaccgcgt caaggagctc atcaagttca
                                                                     1320
                                                                     1380
agggetteca ggtacegeeg geegageteg aggetetget categegeac eegtecateg
ccgacgcggc cgtcgtcccg caaaaggatg atgccgccgg cgaggtcccg gtcgccttcg
                                                                     1440
tggtccgcgc cgccgactcc gacatcgccg aggaggccat caaggagttc gtatccaagc
                                                                     1500
aggtggtgtt ctacaagagg ctgcacaagg tctacttcac ccacgcgatc cccaagtcgg
                                                                     1560
cgtcggggaa gatactcagg aaagaactca gagctaaact cgccgccccg gccactgcct
                                                                     1620
                                                                     1680
gaagagtggt tcaaggcttc atgctaatca tttcgatcag aaaggcagtt cctatgttcc
                                                                     1740
accttttgtt tcatttggaa gattgtattc cagctagtgg ccagtgactg agtaagggat
ggggataaaa gttttgtcta cgttttcttt tacgctactc tctccattga ggagtacaat
                                                                     1800
                                                                     1855
gtatcagggg attcgtgatt gaaattaatc aagattggtt caattaaaaa aaaaa
<210> 28
<211> 2041
<212> DNA
<213> Lolium perenne
<400> 28
gaggaggtgg tggaggagca cgaaatcccg gccgccattc ctccaccttc cgctccgacc
                                                                       60
aaagatttcc atccggcgag atccatgggc tccatcgcgg cagacttggc gccggaggcg
                                                                       120
                                                                       180
cccgcggagc tggtgttccg gtcgaagctc ccggacatcg agatcccgac ccacctgacg
ctgcaagact actgcttcga gcgcctgccg gagctctccg cccgcgcctg cctcatcgac
                                                                       240
ggcgccacgg gcgccgcgct cacctacggc gaggtggacg ccctctcgcg ccgctgcgcg
                                                                       300
                                                                       360
gccgggctgc gccgcctcgg cgtccgcaag ggcgacgtgg tcatggcgct cctccgcaac
tgccccgagt tcgccttcgt gttcctcggc gcggcccggc tcggcgccgc caccaccacc
                                                                       420
gccaacccgt tctacacgcc ccacgagatc caccgccagg ccgccgcggc cggcgccaag
                                                                       480
gtgatcgtca ccgaggcctg cgccgtcgag aaggtgcgcg ccttcgccgc cgagagaggg
atccccgtcg tctccgtcga cgaggccgtc gacgacggct gcctcccgtt cgccgcgact
                                                                       600
                                                                       660
ctcctcgggg aagaaagcgg cgagcggttc gtcgacgagg cggtcgaccc cgacgacgtg
gtggcgctgc cgtactcgtc cggcaccacc ggcctgccca agggcgtcat gctcacccac
                                                                       720
cgcagcctcg tcaccagcgt cgcccagcag gtggacggtg agaacccgaa cctgcacttc
                                                                       780
agetegteeg aegtgetget gtgegtgetg eegetgttee acatetaete geteaacteg
                                                                       840
gtgctgctcg ccggtttacg cgccgggtgc gcgatcgtga tcatgcgcaa gttcgaccac
                                                                       900
                                                                      960
ggcgctttgg tggacctggt gcgcgcgcac ggcgtcacgg tggcgccatt cgtgccgccc
atcgtggtgg agatcgccaa gagcgcgcgg gtgaccgccg cggacctggc gtcgatccgg
                                                                      1020
ctggtcatgt cggggggggc gcccatgggc aaggagctgc aggacgcgtt catggccaag
                                                                      1080
atccccaacg ctgtgctcgg gcagggatat gggatgaccg aggccggccc cgtgctagcc
                                                                      1140
atgtgcctgg ccttcgccaa ggagccgttc gaggtcaagt ctggctcctg cggcaccgtc
                                                                      1200
gteeggaacg eegageteaa gategtegae eeegacaeeg gegeeteeet eggeegeaae
                                                                      1260
ctgccggggg agatctgcat ccgcggcaag cagatcatga aaggttacct aaatgatccg
                                                                      1320
```

gtcgatgatg ggattccaag gatgctgctg gtgcggactg gttgtttct tctggcaaga gataccacac tccaacacca cttttacta catgtataga	agaacaccat acgacgagat tacctccagc tcgtatcgat aaggttcaga acaagaggat tcctcaggaa agtccaaaaa tgtaatgttc gatgtgtcca taaccgcctt ttcaagaaga	ctttattgtc agaacttgaa gcaagacgaa gatcagcgaa ctgcaaagtg ggacctgaga ctaagtcaga ttaatataaa acatatgata ttttgataa	gacagactga gcccttctca cttgctggtg aacgagatca ttcttcggg gcaaagctcg tatattgttt cggaaattat tgtttgttag gaaaggctga	aggagataat ttacgcaccc aagttccggt agcagttcgt attccattcc	caaatataag tgaaatcaag tgcgtttgtt tgcaaaagag aaagagtcca tcccggcagt cacacctctg agggctgatt ggtaacctgt taccatgagc	1380 1440 1500 1560 1620 1680 1740 1860 1920 1980 2040 2041
<210> 29 <211> 1934 <212> DNA <213> Fest	uca arundina	acea				
cggcgagatc tgttccggtc gcttccagcg ccgcgctcac gcctgggggt ccttcgtgtt acacgccca aggcctgcgc ccgtcgacga actcgtccgg ccagcgtcgc tgctgctgtg ggctccgcgc acctggtgcg tcgccaagag gggcggccc tgctcaagat tcgccaagat tctgcatcag actcgtcgga acctagtgcg	aatcccggcc catgggtcc catgggtcc caagctcccg cctgccggag ctacggcgac cctcggcgcc cgagatccac cgtcgagaag ggcgttcgtc caccaccggc ccagcaggtg cgtgctgccg gggttgcgc cgcgcacggc cgcgcacggc cgcgcacggc cgcgcacggc cgcgcacggc catgggcaa gggatatgg gcgttcgac ccggcaagcag cctcgacccc cggcaagcag tattgtcgac	ategeggegg gacategaga cacteegege gtggaegege gaegtegtea geceggeteg egecaggege gaeggeggeg etececaagg gaeggeggg gaeggtgaga etgttecaea ategtgatea gteaeeggegg gagetgeagg gagetgeagg gatgaeggegg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg gaeaeeggeg ateatgaaag tggetgeata agaetgaagg	acgcgccgga tcccgaccca gcgcctgcct tctcccgccg tggcgctgct gcgccgccac ccgccgccga tcgccgccga tcgccgccga tcccgttcgg tcgacccgga gcgtcatgct acccgaatct tctactctct tgcgcaagtt cgccattcgt acctggcgtc acctggcgtc acctggcgtcat cctgccccgt gctcctccgg gttacctaaa ctggagacat actgagacat	ggcgcctccc cctgacgctg catcgacggc ttgcgcggcc ccgcaactgc caccaccgcc cgccaaggtg gagagggata cgacgtggtg cacccaccgc gcacttcagc caactcggtg cgaccacggt gcgccaatc catccggctg ggccaagatc gctgccatc gctgccatgctg gccaacactg tgctgccatc catccggctg gccaacactg gctaacactg tgctgccatcaccgc tgctgccatcaccgc tgctgccatcaccgc tgctgccatcaccgc tgatccggag tggttatgtc atataaggga	gccgagctgg caggactact gccaccggcg ggcctccgcc ccggagttcg aacccgtctct atcgtcaccg accgtcgtct ctcggggaag gcgctgccgt agcctcgtca tcgtcggcg tggtgggag gcgctggtgg gcgctggtgg gcgctggtgg gcgctggtgg gcgctggtgg gcgctggtgg gcccaacgccg tgcctggcct ccggaacgccg tcgcaacgccg tcgcacaaaga gccacaaaga gatgatgacg ttccaagtac	60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 900 1020 1140 1200 1320 1380 1440
ctccggcaga tatcgatgca gttcagagat agaggatctg ttaggaagga ccaaaagcta aatgttctta	acttgaagcc agacgaactt cagcgaaaac caaagtgttc cctgagagca agtcagatat atataaatgg	cttctcatta gctggtgaag gagatcaagc ttcgcggact aagctcgccg attgtttccc aaattaatac	cgcaccctga ttccggttgc agttcgttgc ccattccgaa caggcatccc aaccttacac atatagaagg	aatcaaggat gtttgttgtg aaaagaggtt gagtccttct cggcagtgaa acctctgtcc gctgattctt	gctgctgtcg cggactgaag gttttctaca ggtaagatcc accacacagt aacatcatgt tttactagat	1500 1560 1620 1680 1740 1800 1860 1920
<210> 30 <211> 2014 <212> DNA <213> Loli	um perenne					
ctctgcttct attaccatgg ttccggtcga ttcgagaaga	gatcaagcaa cgctcgatcg gttccgtgcc agctccccga tggccgaggt	ccggccggtg ggaggagtca catcgagatc cgcgtcccgc	aggtagctag gtggtgtccg aacaacgagc ccctgcatca	ctagctactc tggccgcggc agacgctgca tcgacggcca	gtactagate ggagacggtg gagctactge gacgggcgcc	60 120 180 240 300 360

			·				
ataggcatag	aaaaaaacaa	cgtggtgatg	aacctgctcc	gcaactgccc	cgagttcgcc	420	
ttctccttcc	tagacacaac	caggctgggc	gccgccacca	ccaccgccaa	cccgttctac	480	
accccacaca	agatccaccg	ccaggcggag	acaacaaaca	ccaagctgat	cgtcaccgag	540	
acctacacca	tagagaaggt	gctggagttc	gcggcggggc	ggggcctgcc	cgtggtcacc	600	
gtcgacggga	aacacaacaa	gtgcgtggac	ttcgcggagc	tgatcgccgg	cgaggagctg	660	
cccaaaacaa	acqaqqccqq	gatectecce	gacgacgtcg	tcgccctgcc	ctactcctcc	720	
ggcaccaccg	ggctccccaa	gggcgtcatg	ctcacccacc	gcagcctcgt	caccagcgtc	780	
gcccagctgg	ttgacgggtc	gaacccaaac	gtgtgcttca	acaaggacga	cgcgctgctg	840	
tacctactac	cgctgttcca	catctactcg	ctgcacacgg	tgctgctggc	ggggctccgc	900	
gtcggcgccg	ccatcgtcat	catgcgcaag	ttcgacgtcg	gcgcgctggt	ggacctcgtc	960	
cgcgcgcacc	gcatcaccat	cgcgccattc	gtgccgccca	tcgtcgtgga	gatcgccaag	1020	
agcgaccgcg	tcggcgccga	cgacctcgca	tccatccgca	tggtgctctc	cggcgccgcg	1080	
cccatgggca	aggacctcca	ggacgccttc	atggccaaga	tccccaacgc	cgtgctcgga	1140	
cagggttacg	ggatgactga	ggccgggccg	gtgctggcca	tgtgcctggc	gttcgccaag	1200	
gagcccttca	aggtcaagtc	cgggtcgtgc	ggcaccgtgg	tgcgcaacgc	agagctcaag	1260	
gtcgtcgacc	ccgacaccgg	cgcatccctc	ggcaggaacc	agcccggcga	gatctgcgtc	1320	
cgcgggaagc	agatcatgat	aggttacctg	aacgacccag	agtctaccaa	gaacaccatc	1380	
gacaaggacg	gctggctgca	caccggagat	atcggcttgg	tggacgacga	cgacgagatc	1440	
ttcatcgtcg	acaggctcaa	ggagatcatc	aagtacaagg	gcttccaggt	ggcgccggcg	1500	
gagctcgagg	ccctcctcct	cacgaacccg	gaggtcaagg	acgccgccgt	cgtaggggtg	1560	
aaggatgatc	tctgcggcga	agtcccggtc	gccttcatta	agaggatcga	aggatctgag	1620	
atcaccgaga	acgagatcaa	gcaattcgtc	tcaaaggagg	ttgttttcta	caagaggatc	1680	
aacaaggtct	acttcaccga	ctccattccc	aagaaccctt	ccggcaagat	cgtaaggaag	1740	
gacttgagag	ccaggctcgc	cgctggcatc	cccaccgaag	ttgccgcgcc	gagaagctaa	1800	
gggccgcttc	tcaggaacgc	aatcacccat	ggtgctgttt	aggtgctgtt	atagaccaca	1860	
ccaaatgggg	aaagaaacta	cgggaggga	tcatattatt	cttgcaggag	atatcagttt	1920	
gttgattcgc	cctgcttgtg	taatgttgat	aaaatgaaat	gatagaatag	atgtgttgtt	1980	
		aaaaaaaaa				2014	
<210> 31 <211> 2073 <212> DNA <213> Fest	uca arundin	acea					
		accu					
<400> 31		400u					
<400> 31			tcccacgact	aatttaacca	ccttacaaga	60	
gagcaagcgc	gcgcacgcac	tcgcaccatc	tcccacgact	aatttaacca gtgaggtagc	ccttacaaga tagctagcta	60 120	
gagcaagcgc agatttcctt	gcgcacgcac agtctccgtt	tcgcaccatc tctctctcga	tcgccggccg	gtgaggtagc	tagctagcta		
gagcaagcgc agatttcctt ctcgtagatc	gcgcacgcac agtctccgtt attaccatgg	tcgcaccatc tctctctcga ggtctgtgcc	tcgccggccg ggaggagtca	gtgaggtagc gtggtagccg	tagctagcta cggccgtggc	120	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga	tcgcaccatc tctctctcga ggtctgtgcc agctccctga	tcgccggccg ggaggagtca catcgagatc	gtgaggtagc gtggtagccg aacaacgagc	tagctagcta cggccgtggc agacgctgca	120 180	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc	gegeaegeae agteteegtt attaceatgg tteeggtega ttegagaaga	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt	tcgccggccg ggaggagtca catcgagatc cgcatcccgc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca	tagctagcta cggccgtggc agacgctgca tcgacgggca	120 180 240	
gagcaagege agattteett etegtagate ggagaeggtg gagetaetge gaegggegee	gegcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg	120 180 240 300	
gagcaagege agattteett etegtagate ggagaeggtg gagetaetge gaegggegee geteeggege	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga	tegeeggeeg ggaggagtea categagate egeateeege ggagteeetg egtggtgatg	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgccc	120 180 240 300 360	
gagcaagege agattteett ctegtagate ggagaeggtg gagctaetge gaegggegee geteeggege egagttegee	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgatg gcggctcggc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgccacca	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgccc ccaccgccaa	120 180 240 300 360 420	
gagcaagege agattteett ctegtagate ggagaeggtg gagctaetge gaegggegee geteeggege egagttegee ecegttetae	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc accccgcacg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc agatccaccg tggagaaggt	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagttc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgccacca gcggcgggcg gcggcggagc	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc	120 180 240 300 360 420 480 540	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gactgggcgcc gctccggcgc cgagttcgcc ccgttctac cgtcacggag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gcctgcgcg gctgacggg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggcga tgggcgcga tgggcgcgcg tggagaaggt agatccaccg tggagaaggt agcgcgacgg	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtgggtagg gcggctcggc ccaggcggag gctggagttc gtgcgtcgac	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgccacca gcggcggagc gcggcggagc ttcgcggagc	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcgggggg gcaactgcc ccaccgccaa ccaaggtgat ggggactgcc tgatcgccgg	120 180 240 300 360 420 480 540 600	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gactgggcgc gctccggcgc cgagttcgcc ccgttctac cgtcacggag cgtggtgacc cgaggagctg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc acccgcacg gctggcgcg gctgacggga cccgaggcgg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggc ggaagggcga tgggcgcgcg tggagacggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtgggtagg gcggctcggc ccaggcggag gctggagttc gtgcgtcgac gatcctccc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcggcagcag gcggcggagc ttcgcggagc gacgacgtcg	tagctagcta cggccgtgca agacgctgca tcgacggca ccgcggcggg gcaactgcc ccaccgcaa ccaaggtgat ggggactgcc tgatcgccgg tggccctgcc	120 180 240 300 360 420 480 540 600 660 720	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactccggcgc gctccggcgc ccgattccac cgtcacggag cgtggtgaccc gtggtgacccg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc acccgcacg gcctgcgcgg gtcgacggga cccgaggcgg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggaggcgacggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcgga gctggagtc gtggagtc gtggtcgac gatcctccc gggcgtcatg	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcggcagcg gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgc tgatcgccg tggccctgc gcagcctcgt	120 180 240 300 360 420 480 540 600 660 720 780	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactggcgc gctccggcgc ccagttcac cgtcacgag cgtggtgacc gaggagcc gtactcgtcc caccagcgtc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc accccgcacg gcctgcgcgg gtcgacggga gcgaccaccg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg ggctcccaa ttgacggtc	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagtc gtgcgtcgac gatcctccc gggcgtcatg gaacccgaac	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcgggcg gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca	tagctagcta cggccgtggc agacgctgca tcgacggcagg gcaactgccc ccaccgccaa ccaaggtgat gggactgc tgatcgccg tggcctgc gcagcctcgt acaaggacga	120 180 240 300 360 420 480 540 600 660 720 780 840	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactcggcgc gctccggcgc ccagttctac cgtcacggag cgtggtgacc cgaggaggagctc gacacgcgtc caccagcgtc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc accccgcacg gcctgcgccg gtcgacggga cccgaggcgg ggcaccaccg gccagctgt tqcctgctgc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg agggccgga ggctccccaa ttgacggtc cgctcttcca	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcgga gctggagttc gtgcgtcgac gatcctccc gggcgtcatg gaacccgaac catctactcg	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg	tagctagcta cggccgtggc agacgctgca tcgacggcagg gcaactgccc ccaccgccaa ccaaggtgat gggactgcc tgatcgccgc tgacctgcc gcagcctcgt acaaggacga tgctgctgcc	120 180 240 300 360 420 480 540 600 660 720 780 840 900	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactcggcgc gctccggcgc ccattctac cgtcacggag cgtggtgacc cgaggaggagctc gaccagcgtc caccagcgtc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc accccgcacg gcctgcgccg gtcgacggga cccgaggcgg ggcaccaccg gccagctgt tgcctgctgc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg agggccgga ggctccccaa ttgacggtc cgctcttcca ccatcgtcat	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcgga gctggagttc gtgcgtcgac gatcctccc gggcgtcatg gaacccgaac catctactcg catggcaag	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacacgg ttcgacgtcg	tagctagcta cggccgtggc agacgctgca tcgacggcagg gcaactgccc ccaccgcaa ccaaggtgat gggactgcc tgatcgccgc tgacctgcc gcagcctcgt acaaggacga tgctgctgc gcagctcgt acaaggacga tgctgctggc gcgcgctggt	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactccgcc gctccggcgc cgagttcgcc cgtgcacggag cgtggtgacc cgagggagctcg gtactcgtcc cgcgctgctg gggctccgc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc accccgcacg gcctgcacg gccgaggcgg ggcaccaccg gccacaccg gccagctgt tgcctgctgc gtcgacgcg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg aggaggccga ggctccccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagttc gtgcgtcacc gggcgtcatc gaacccgaac catctactcg catgcgcaag ccatgcgcaag cggccatt	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg acctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacacgg ttcgacgtcg gtgccccga	tagctagcta cggccgtggc agacgctgca tcgacggcggg gcaactgccc ccaccgccaa ccaaggtgat gggactgc tgatcgccg tgacctgcc gcagcctcgt acaaggacga tgctgctgc gcgcgctggt tcgtggtgga	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gactccggcgc gctccggcgc ccagttctac cgtcacggag cgtggtgacc cgaggagctg gtactcgtcc cgcgctgctg ggggctccgg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gcctgcgcg gcctgacgcgg ggcaccaccg gcccagctgt tgcctgctgt gtcggggccg gccagctgt	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaaggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg agcgcgcga ggctccccaa ttgacggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgcga	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagtc gtgcgtcacg gatcctccc gggcgtcatg gaacccgaac catctactcg catgcgcaat ccgccatc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgcacca gcggcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg ttcgacgtcg gtgccccga tccatccgca	tagctagcta cggccgtggc agacgctgca tcgacggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgc tgatcgccgg tggccctgc gcagctcgt acaaggacga tgctgctgc gcgcgctggt tcgtggtgga tggtgctcc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gacgggcgcc gctccggcgc cgagttcqcc ccgttctac cgtcacggag cgtggtgacc cgaggagctg gtactcgtc gggctccgc gggctccgc ggacctcgtc gatcgccaag cgqcqccaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gcctgcgcg gtcgacggga cccgagggg gcaccaccg gccagctgt tgcctgctgc gtcgggcccc agcggcacc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaaggcga tgggcgcggc agatccaccg tggagaaggt agcgcgacgg agcgcgcgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgcga aggacctcca	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagtc gtgcgtcac gaccccac ggagtcatc catctactcc catgcgcaag cgegccattc cgacctcaca ggacgttcaca ggacgttcaca ggacgcttcaca	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgcacca gcggcggagc ttcgcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg ttcgacgtcg atcgacgtcg atcgacgtcg atggacgtcg acgacgtcg acgacgcaaga	tagctagcta cggccgtggc agacgctgca tcgacggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc tgatcgccgg tggccctgcc gcagcctcgt acaaggacga tgctgctggc gcgcgctggt tcgtggtgga tggtgctctc tccccaacgc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gacgggcgcc gctccggcgc cgagttcqcc cgtcacggag cgtggtgacc cgaggagctg gtactcgtcc caccagcgtg gggctccgc gggctccgc ggacctcgtc gatcgccacag cggcgccgcg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gcctgcgcg gccagcgga gcaccaccg gccagcgga gcaccaccg gccagctgt tgcctgctgc gtcgggcccc agcggcccc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaaggcga tgggcgcgc agatccaccg tggagaaggt agcgcagg agcgcggg ggctcccaa ttgacggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactga	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagtc gtgcgtcac gacctcacc gggcgtcatg gaacccgaac catctactcg catggcaag cggccattc cgacctcaca ggacgcttc ggacgctcac ggacgctcac ggacgctcac ggacgccattc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgcacca gcggcggagc ttcgcggagc ttcgcggagc gtgacgtcg ttcacccacc gtgtgcttca ctgcacacgg ttcgacgtcg atcgacgtcg gtgccccga tccatccgca atggccaaga gtgctggcca	tagctagcta cggccgtggc agacgctgca tcgacggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc tgatcgccgg tggccctgcc acaaggccg tgcgcctgct acaaggacga tgctgctggc tgcgctggt tcgtggtgga tggtgctctc tccccaacgc tgtgcctggc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gacgggcgcc gctccggcgc cgagttcqcc ccgttctac cgtcacggag cgtggtgacc cgaggagctg gtactcgtcg gggctccgcg ggacctcgtg ggacctcgtg ggacctcgtg gtactcgtcg ggacctcgtg	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc acccgcacg gctgacgga gcacaccg gagaccaccg gagaccaccg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg ggctcccaa ttgacggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca aggacctcca aggacctcca aggtcactga	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgatg gcggctcggc ccaggcggag gctggagttc gtgcgtcacc gggcgtcatg gaacccgaac catctactcg catgcgcaatc cgacctcaca ggacgcttc ggcggtcatc ggcggtcctgc cgggtcctgc	gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgcacca gcggcggagc ttcgcggagc ttcgcggagc ttcgcgcacca gtgtgctca gtgccccac gtgccccga tccatccgca atggccaaga gtgctggca gcaccgtgg	tagctagcta cggccgtggc agacgctgca tcgacggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc tgatcgccgg tggcctcgt acaaggacga tgctgctgt acaaggacga tgctgctgc gcgcgctggt tcgtggtgga tggtgctcc tccccaacgc tgtgcctggc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gacggcgcc gctccggcgcc ccgagttcgcc ccgttctcgc cgaggagctg gtactcgtcc caccagcgtc cgcgctgctg gggctccgc ggacctcgtc gatcgccaag cgtgtccaag cgtgtccaag cgtgctcaag cgtgctcaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc gcctgcgcg gctgacgga cccgagcgg ggcaccaccg gccagctgt tgctgctgc gcggcgcacc agcgaccgcg ccagggcacc agcgaccgcg ccatgggcac agcgacccca gcgcccacc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcggc agatccaccg tggagaaggt agcgcgacgg aggaggccgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca aggacctcca aggatgactgc	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgatg gcggggagtc gtgcgtcgac gatcctccc ggcgtcatg gaacccgaac catctactcg catggcaag cgcgcatt cgacctcaca ggacgctcac ggcgctcac ggcgctcac cgacctcaca ggacgctccc cggccgtcctc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgcacca gcggcggggg gcggcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg ttcgcgcaca gtgcccccga acgccacagg gtgcccacca ggcaccgtgg gcgcacaga	tagctagcta cggccgtgca agacgctgca tcgacgggag gcaactgcc ccaccgcaa ccaaggtgat gggactgcc tgatcgccgg tggccctgc gcagcctcgt acaaggacga tgctgctggc gcgcgctggt tcgtggtgga tggtgctctc tccccaacgc tgtgcctggc tgcctggc tgcctggc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260 1320	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gacgggccc gctccggcgc ccgagttcgcc cgtcacggag cgaggagctg gtactcgtcc caccagcgtc gggctccgc ggacctcgtc gagcctcgcg gacctcgcg gatcgccaag cgtgctcgag gttcgccaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atgggcgtgg ttctccttcc acccggacggg gcacggga cccgagggg ggcaccaccg gcctgcgccg gccagctgt tgcctgctgc gcgggaccacca agcgaccgcg cccatgggcac agcgccacca agcgaccgca ccggggaaccaccg	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgacgg agatcaccg tggagaaggt agcgcgacgg aggaggccgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca aggacctcca ggatgactga aggtcaagta ccgcacaccgg aggtcaagta	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtcctg cgtggtgatg gcggggtcggc gtgcgtcgac gatcctccc ggcgtcatg gaacccgaac catctactcg catgcgcaat cgacctacac ggacgcttc ggcgcattc cgacctcaca ggacgcgtc ggcggtcctgc cgcatcctc aggtactct	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgcacca gcggcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacaccg ttcgccgaa tccatccgca atggccagaa gtgctgcag gggcggaacc acgaccgtg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcgggggg gcaactgcc ccaccgccaa ccaaggtgat ggggactgcc tgatcgccgg tggccctgc gcagcctcgt acaaggacga tgctgctgc gcgcgctggt tcgtggtgga tggtgctct tccccaacgc tgtgcctgc tgcgcaacgc agcctggcaacgc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gactcggcgc ccgattcgcc ccgtcacgag cctcacgag gtactcgtc gtactcgtc gggctccgc ggacctcgtc gagcctcgtc gatcgccaag cggcgccgcg gatcgccaag cgtgctcgga gtactcgtcg gacctcgtc gatcgccaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gctgacgga cccgaggcgg ggcaccaccg gccagctgt tgcctgccg cccatgggcac agcgaccgc agcgcgcacc agcgaccgc ccatgggcac cagggttacg ccgggaacc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgacgg aggtcaccg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat gcatcaccat gcatcaccat gcatcaccat gcatcaccat gcatcaccat ccacgcga aggacctcca aggacctcca ggatgactga aggacctcca ggatgactga aggtcaagtc aggtcaagtc aggtcatga aggtcaacgg agatcatgat gctggctgca	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtgggatcggc ccaggcggag gctggagtc gtcgtcgac gatcctccc ggcgtcatg gaacccgaac catctactcg catgcgcatc cgacctcaca ggacgcatt cgacctcaca ggacgcgtctg cgggtcctg cgcgtcctc cgacctcac caggtaccg cgggtcctg cgcatcctc aggtacctc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gccgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacaccg gtgcccccga tccatccgca atggccaccag ggccggaacc acggccggaacc aacgacccag atcggcttgg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcgggggg gcaactgccc ccaccgccaa ccaaggtgat ggggactgcc tgatcgccgg tggccctgc gcagcctcgt acaaggacga tgctgctgc tcgtggtgga tggtgctct tccccaacgc tggcctggc tgcctggc agcctggc agcctggcaacgc agcctggcaacgc agcctggcaa	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactactgc gctccggcgc ccgattcgcc cgtcacggag cgtggtgacc caccagcgtc gagctcgtc gggctccgc gacctcgtc gatcgccaag cggcgccgcg cgtgctcgag gtactgccaag cgagctcaag cgagctcaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gctgacgga cccgaggcgg ggcaccaccg gccagctgt tgcctgccg gccagctgt tgcctgccg gccagctgc agcgcaccc agcgaccgcg cccatgggca ccaggttacg gagcccttca gagcccttca gagcccttca gtcgtggaagc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tgggcgacgg agatccaccg tgagagaggcgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactgc aggactcaca tcaccgcga aggactcaca tcaccgccga aggactcaa tcacaccat tcaccgccga aggactcaa aggacactca aggacacca aggacaccac ccgacaccgg agatcatga acagctcaa acagctcaa	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccatg cgtgggagtcggc ccaggcggag cctggagtcgc gatcctccc ggcgtcatg gaacccgaac catctactcg catgcgcatc cgacctcaca ggacgctt ggcggtcatg cgactcaca gacgcgtcat cgacctcaca ggacgctt cgacctcaca ggacgcattc cgacctcaca ggacgcattc cgacctcaca ggacggtctgc cggatcctgc cgcatccctc aggttacctg cgcatccctc aggttacctg cgagacc gagatcatc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg ttcgacgtcg gtgccccga acgaccctga ggcacctgca atggccacag ggccggaacc acgacccag atcggcttgg aagtacaagg aatggcttgg aagtacaagg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgcca ccacgccac ccacgccac tgatcgccg tggccctgc gcagcctcgt acaaggacga tgctgctgc tcgtggtgga tggtgctct tccccaacgc tggtgctggc tggcctggc tgcctggc tgcgctggt tcgtggtgga tgctctc tccccaacgc tgtgccaacgc tgcgcaacgc agcctggcga agtcgaccaa tggatgacga gcttccaggt	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500	
gagcaagcgc agatttcctt ctcgtagatc ggagcagtg gagctactgc gactccggcgc ccgttccac cgtcacgag cgtggtgacc cgtgagagctc gagagagctc gagctccgc ggacctcgtc gacctcgtc gacctcgtc gatcgccaag cgtgctcaag cgtgctcaag gatctcaag	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gctgacgga cccgaggcgg ggcaccaccg gccagctgt tgcctgctgc gccagctgt cgcgcgcacc agcgaccgc cccatgggca cccatgggca cccatggca cccatggca cccatggca cccatggca cccatggca cccatggca cccatggca cccatggca ccaggttacg gagccttca gtcgtcgacc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggagaaggcga tggagaggcgg agatccaccg tggagaggcgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactga aggtcactga aggtcactga aggtcactga aggtcactga aggtcactga accgcgacaccgg agatgactga accgcgacaccgg agatcattga accgctccac accaggctcaa	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgagg ccaggcggag ccaggcggag gtcgtcatc gatcctccc ggcgtcatc gacccgaac catctactcg catggcaac catctactcg caggcgtcatc cgacctcaca ggacgcattc cgacctcaca ggacggtccg cggtcctgc cgatcctc cgggtcctgc cgatcctc caggttacctc aggttacctc aggttacctc cacggagac cacggagac cacggagac cacggagac cacggagacccg	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcaccacc gtgtgcttca ctgcacacgg ttcgacgtcg gtgccccca atggccacaa ggcgcggagc acgacctgg ggccgcacca atggccacaa ggcacctgg ggccggaacc aacgacccag atggctagg ggcggaacc aacgacccag gaggtcaagg gaggtcaagg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc tgatcgccg tgatcgccg tacaaggcga tgctgctgc gcagcctcgt acaaggacga tgctgctgc tcgtggtgga tgctgctct tccccaacgc tgtgcctgc ggcgctggt tcgtggcaacgc tgcgcaacgc agcctggcaa tggtgacta agcctggcga agtcgacaa tggatgacga agtcgacaa tggatgacga gcttccaggt acgccgcgt	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1500 1560	
gagcaagcgc agatttcctt ctcgtagatc ggagcagtg gagctactgc gactccggcgc ccgttccac cgtcacgag cgtggtgacc cgtggtgacc cgagttcgcc caccagcgtc cgcgctgctg ggacctcgtc gagcctcacg cgtgctcaag cgtgctcaag cgtgctcaag cgtgctcaag gttcgccaag gttcgccaag gatctcatc gacctcatc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccgcacg gctgacgga cccgaggcgg ggcaccaccg gccagctgt tgcctgctgc gccagctgt cgcgggaccc agcgaccgc cccatgggcac cagggttacg gagccttca gtcgtgacgga cccaggttacg gagccttca gagcttcac gagcgttacg gagccttca gagcttcac gagcgtacc	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggagaaggcga tggagaaggcga aggaggcgg agatccacca ttgacggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactga aggacctcca ggatgactga aggacctcca tcaccgcga acgatgactga acgctcat gcatcatcat tcaccgccga acgatgactga acgctcat ccgacaccgg agatcattgat accgctgctgca cctgctctcat tctgcgcga	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtcagg ccaggcggag ccaggcggagtcccg gatcctccc gggcgtcatg gaacccgaac catctactcg catggcaag cgcgccattc cgacctcaca ggacgcgtca ggacgctcatg caccggacc cgacctcaca ggacggtccg cgacctccc cgggtcctgc cgacccggtcctg caggtacctc aggtacctc aggtacctc aggtacctc aggtacctc aggtacccg caccgagac cacgaacccg agtcccggtc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctaccaccg gtgcttca ctgcacacgg ttcgacgtcg gtgccccga atcgctcgca atggccacaa ggcaccgtgg ggccggaacc acgacccagg ggccggaacc aacgacccagg ggccggaacc aacgacccag gaggtcaagg gaggtcaagg gaggtcaagg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat gggactgcc tgatcgccg tggccctgc gcagcctcgt acaaggacga tgctgctggc gcgcgctggt tcgtggtga tgccctgc gcgcctggc tgcccaacgc tgcccaacgc tgtgcctgc tgcccaacgc tgtgcctgc tgcccaacgc tgtgccaggc tgcccaacgc tgtgccaggc tgcccaacgc tgcgcaacgc agcctggcga agtcgacaa tggatgacga gcttccaggt acgccgcgt agaggatcga	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500 1560 1620	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gacgggcc gctccggcgc ccgttctac cgtcacggag cgtggtgacc caccagcgtc cgcgctgctg ggacctcgtc gagcccaag cgtgctcgag cgagcccaag cgagctcaag cgagccaag cgagccaag cgagccaag cgagccaag gatctgccaag gatctgcaag gatctgcaag gatctgcaag gatctgcaag agacaagaatc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctcctcc acccggacggg gcgacggga gccaccgg gccagctgt tgcctgctgc gccagctgt tgcctgctgc gccagctgt tgcctgctgc gcgggaccc agcggcacc agcgaccgcg tccatggga ccggggaagc ccagggttacg gagcccttca gccggggaagc gcgaggaagc gcgaggaagc gagcaccacg gacacgggaagc agcgggaagc gagcacacggaagc agcacacgggaagc agcacacggaagc agcacacggaagc agcacaggaagc agcacaggaagc aacacgagaagc aacacgaga	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggagaggcga tggagaggcgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactga aggtcaccat tcaccgccga aggacctcca ggatgactga acggtcaccac tctgcgcga aggacctca tcaccgccga aggacctca acgccaccgg agatcaccac tctgcgcga acaccgg	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgagg ccaggcggagtccccg gtgcgtcagg gctcgcccgaac catctcccc ggagctcatc gaacccgaac catctactcg catgcgcattc cgacctcaca ggacgcattc cgacctcaca ggacggtccg cgggtcctg cgggtcctg cgggtcctg caggtacctc aggtacctc aggtacctc aggtacctc aggtacctc aggtacctc cacggagac gaacccg agccggtc gcatcctt accggaccc gcatccctc aggtactcc cacgaacccg agtcccggtc gcaattcgtc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacccga ttcgacgtcg gtgcccccga tccatccgca atgccaaca ggcaccctga ggccggaacc acgaccctag ggccggaacc aacgacccag ggccggaacc aacgacccag ggcgttcagc acgacttcg gaggtcaagg gaggtcaagg gaggtcaagg gaggtcaagg	tagctagcta cggccgtggc agacgctgca tcgacgggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat ggggactgc tgatcgccg tggccctgc acaaggcacga tgctgctgc tcgtggtgg tcgtggtgt tcgtggtgg tggtgcttc tccccaacgc tgtgcctggc tggcaacgc agcctggc agcctggc agcctggc tgcccgga tgtgtctc tccccaacgc tgtgccagca tgtgcctggc tgcgcaacgc agcctggcga agtcgacaac tggatgacga tggatgacga tggatgacga tggatgacga tggttttcta	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500 1660 1620 1680	
gagcaagcgc agatttcctt ctcgtagatc ggagcacgtg gagctactgc gactcggcgc ccgttccac cgtcacgag cgtggtgacc caccagcgtc ggactcgtc ggactcgcg cgcgctgctg ggacctcgtc gatcgccaag cgggcgccgcg cgtgctcgag gttcgccaag cgagctcaag cgagctcaag cgagctcaag cgagctcaag gatctcgccaag cacacatcccatc gagcgccgcg cgacacatcccatc	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccggagcgg gcgacggg gcgacggg ggcaccacgg gccagctgt tgcctgctgc gcgggcacc agcggcacc agcggctacc agcggctacc agcgccttca gccggggaagc ccggggaagc ccggggaagc ccggggaagc ccggggaagc ccggggaagc ccggggaagc cagggttacg cagcgttca	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggagaggcgg agstccacca ttgacgaggt agcgcgacgg ggctcccaa ttgacggtc cgctcttca ccatcgtcat gcatcaccat tcaccgccga aggacctca aggatgactga aggtcaggt ccgctctca ccatcgtcat tcaccgccga aggacctca aggatgactga acgtcaccgg agatcatcaa acctcctcct tctgcggcga acgacatcaa acctcaccga	tcgccggccg ggaggagtca catcgagatc cgcatcccgc ggagtccctg cgtggtgagg gctgggagtc gtgcgtcagg gctggagtcatc gacctcacc ggagccatcccc ggagcatcatc gaacccgaac catctactcg catggcatcac gacctcaca ggacgcattc ggacctcaca ggacgctctg cgacctcaca gacggatcctg cgatccctc aggtacctc aggtacctc caccggagac catcactc caccggagac ccaccgagac caccgatcctc caccgagac caccgagac caccgagac caccgatccct caccgatccct caccgatccct caccatccct caccatcccc caccatccct caccatcccc caccatccct caccatcccc caccatccct caccatcccc caccatccct caccatcccc caccatccct caccatccc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc ttcgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacacgg ttcgacgtcg gtgccccga atgccacaca gggcggagc acgacctag ggccggaacc acgacccag ggccggaacc acgacccag ggccggaacc acgacccag atgcttcatca atgccaaga ggccgcacc acgaccctgg gacccttcatca atgacaagg aagaccctt	tagctagcta cggccgtggc agacgctgca tcgacggca ccgcggcggg gcaactgccc ccaccgccaa ccaaggtgat ggggactgc tggccctgc gcagcctcgt acaaggacga tgctgctggc gcgcgtggt tcgtggtgga tggtgctct tccccaacgc tgtgcctggc tggcctggc tgcgcaacgc agctggcaacgc agctggcaacgca agtcgaccaa tggatgacga tggtgatcaca tggatgacga tggtcacagt acgccgcgt acaggatcaacga tgttccaggt acgccgcgt acgaggatcga ttgtttcta ccggcaagat	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740	
gagcaagcgc agatttcctt ctcgtagatc ggagacggtg gagctactgc gactcggcgc ccgattcgcc cgtcacgag cgtggtgacc cgtggtgacc cacagcgtc ggacctcgtc ggacctcgtc gatcgccaag cgtgctcaag cgtactgctc gaacaccatc caagagatc caagagatc cctaaggaag cctaaggaac	gcgcacgcac agtctccgtt attaccatgg ttccggtcga ttcgagaaga tcctacacct atggcgtgg ttctccttcc acccggagcgg gccagcgg gccagctgt tgcctgctgc gccagctgt tgcctgctgc gccagctgc cgcgggcacc agcgaccgcg cccatgggcac gccatgggcac gccatgggcac gcgaggaagc ccggggaagc ccggggaagc ccgagggaagc cagggttacg gaccaccgg adcaccgcg adcaccgcg adcaccgcg adcaccgagaagc gaccaccggaagc ccagggaagc ccagggaagc cagggaagc cagggaagc cagaggaagc cagagaagc cagagagaagc cagagagaagc cagagagacg caccaccgagaagc cagagagacg cacaccgagaagc cagagagacg cacaccgaga	tcgcaccatc tctctctcga ggtctgtgcc agctccctga tggccgaggt acacagaggt ggaagggcga tggagaggcga tggagaggcgg ggctcccaa ttgacgggtc cgctcttcca ccatcgtcat gcatcaccat tcaccgccga aggacctcca ggatgactga aggtcaccat tcaccgccga aggacctcca ggatgactga acggtcaccac tctgcgcga aggacctca tcaccgccga aggacctca acgccaccgg agatcaccac tctgcgcga acaccgg	tcgccggccg ggaggagtca catcgagatc cgcatcccg ggagtccctg cgtggtgatg gcggctcggc ccaggcggagtc gatcctccc ggcgtcatg gaacccgaac catctactcg catgcgcatc cgacctcaca ggacgcattc cgacctcaca ggacgtcctg cggtcatg cggtcctgc cgatcctc aggtacct caccggagac caccgaac cctcact gccgcatcctc cgcatcctc caccggagac cgagatcatc caccgagac cgagatcatc caccgagac cgagatcatc caccgagac cgagatcatc caccgatccct caccgatccct caccgatccct caccgatccct caccgatccct caccgatccct caccgatccct caccgatc	gtgaggtagc gtgaggtagc gtggtagccg aacaacgagc ccctgcatca acccgtcgcg aacctgctcc gcgccacca gcggcggagc gtgcggagc gacgacgtcg ctcacccacc gtgtgcttca ctgcacacga ttcgacgtcg gtgccccga tccatccgca atggccaaga gtgctggca ggcaccgtag gacaccgtg gacaccag acgacccag acgacccag acgaccag acgacccag acgaccag acgaccag acgacccag acgacccag acgaccag acgacccag	tagctagcta cggccgtggc agacgctgca tcgacggca ccgcggcggg gcaactgcc ccaccgccaa ccaaggtgat gggcctgc tggccctgc gcagcctcgt acaaggacga tgctgctggc gcgcgctggt tcgtggtgga tggtgctct tccccaacgc tgtgcctggc tggccaacgc agcctggcaacga agtcgaccaa tggatgacga tcgatgacga tcgtcagcga agtcgaccaa tggtgccgca tccaggt acgacga tccaggt acgacga tccaggt tccaggt acgacga tccaggt tccaggt tccaggt acgacgaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat tccaggcaccat	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500 1660 1620 1680	

caaatgggga	aagaaactac	gggagggtac	atgatcagat	tattcttgca	ggagatatca	1920
gtttgttggt	tegecetget	tgtgtaatgt	tgataaaatg	aaatgatata	atagatgtgt	1980 2040
tgttttattt	ttttgaccat	gtaagaacaa	ggctgggatt	ttactcccaa	acaaacaaaa	2040
agaacaaggc	tgggattttt	ttcaaaaaaa	aaa			2075
<210> 32						
<211> 1798						
<212> DNA						
<213> Loliu	m perenne					
<400> 32						60
gctcaacact	cgccaatccc	acagccacag	aagccaccta	ccaccgctcc	accyatcyac	120
gatggaggtc	ctcctcctgg	agaaggccct	actggggcte	ttcgcggcgg	cggrgcrggc	180
catcgccgtc	gcgaagctcg	ccggcaagcg	etteegeete	ccgcccggcc	agetaataga	240
ccccatcgtc	ggcaactggc	recagging	agtagagata	aaccaccgca ggcatccgca	acctgatggg	300
catcgcgaag	eggttegggg	aggigileet	geteegearg	cagggcgtgg	acttggtggt	360
ggtgtccagc	angtest	tcaaggaggt	caccacaca	ggccaggaca	tggtcttcac	420
cegeaceege	gacgactggc	acaadataca	ccccatcata	accgtcccct	tcttcaccaa	480
calcuacyge	gaccacagge	gaataaacta	agaggaggag	gccaggctcg	taataaaaa	540
catcaaggcg	gacccaacat	tcacaaccac	caacaccata	atccgccgta	ggctgcagct	600
catdatatac	aaccacatot	tccccatcat	attcaaccac	aggttcgagt	ccgtcgacga	660
cccactcttc	aacaagctca	aggccatgaa	caccaaacac	agcatcctgt	cgcagagctt	720
cgactacaac	tacggcgact	tcatccccat	tctccgaccg	ttcctccgca	agtacctcaa	780
ccaatacaca	aacctcacga	ccaagaggat	gaagctcttc	gaggaccact	tcgtcgctga	840
cagaaagaag	gcgctggagc	agaatgggga	gatcaggtgc	gccatggacc	acatcctgga	900
ggcggagagg	aagggcgaga	tcaaccacga	caacgtcctc	tacatcgtcg	agaacatcaa	960
cgttgcagcc	atcgagacaa	cgctgtggtc	gatcgagtgg	ggcatcgcgg	agctggtgaa	1020
ccacccggac	gtccagtcga	agctccgcga	cgagatgacc	gccgtgctgg	gcgccgacgt	1080
ggcggtgacg	gagccggacc	tggagcgcct	cccctacctg	cagtccgtcg	tgaaggagac	1140
cctccgcctc	cgcatggcca	tecegetget	cgtgccgcac	atgaatctca	gcgacgccaa	1200 1260
gctcgccggc	tacgacatcc	ccgccgagtc	caagatcctc	gtcaacgcat	ggtteetege	1320
caacgacccc	aagcggtggg	tgcgcgccga	cgagttcagg	cccgagcgct	gcgtcggagga	1380
ggagaaggcc	gtcgaggccc	acggcaacga	gagatata	gtgcccttcg ggcatcacgc	tcaacacct	1440
ceggagetge	ttagagateg	taccaccacc	caaacaaac	aagatcgata	ссасспапаа	1500
acccaaacaa	ttcagcaacc	agatoctoaa	gcacgccacc	gtcgtctgca	agccgctcga	1560
gcccggacag	tttctatttq	atcotatoga	ggcttctgac	atgcgtgtct	gtgcatgcat	1620
gcgtgaacgc	taataccaaa	agatcgatct	atgcacgcat	gtgatgtgta	ttttcctttt	1680
tttatacttt	tattttactt	agttgcattt	ttgttggtct	tcatgtaagg	cgtcatgttg	1740
tagatttgct	atgttggtga	taatgatgta	aaacttcttc	aaaaaaaaa	aaaaaaaa	1798
<210> 33						
<211> 1775 <212> DNA						
	uca arundin	acea				
(215) 1000		a 0 0 a				
<400> 33						
gcaacaaccg	ttactgagcg	cgcgaaaacg	cacgagagag	agagtgaagc	ggcgcgtgta	60
ttcttcactg	gccgtcgcca	tggatttcgt	cttcgtggag	aagctcctcg	tegggeteet	120
agcgtccgtg	gtggtcgcga	tcgtcgtgtc	caagatccgc	ggccgcaaac	tgaggctgcc	180
gccgggcccc	atccccgtgc	ccatcttcgg	caactggctg	caggtcgggg	acgacctgaa	240
ccaccgcaac	ctggcggcga	tggcccgcaa	gttcggggag	gtgttcctcc	teegeatggg	300 360
catccgcaac	ctggtggtgg	tgtcgagccc	ggagetggee	aaggaggtgc	ccacacgca	420
gggcgtggag	ttcgggtccc	gcacacgcaa	cgtcgtcttc	gacatettea	ccggcaaggg ccatcatcac	480
gcaggacatg	ttancana	Lgcacggcga	deadiggege	aagatgcggc gccgggtggg	addeddaedde	540
ggtgeeette	atagacaaca	tacacaccae	. geaglacegg .ccccaaddcc	gccaccgacg	acataatact	600
ggcccccgcc	ctacaactaa	tgatgtacaa	caacatotac	cgcatcatot	tcgaccggcg	660
attagadada	atggacgacc	cactetteet	ccacctcaaa	gcgctcaaca	gcgagcgcag	720
ccacctaaca	cagagetteg	agtacaacta	cagcaactto	atccccgttc	teegeeeett	780
cctccqcqqc	tacctcgggc	tctgcgaaca	ggtcaaggag	acccgcctca	agctcttcaa	840
ggattacttc	ctggacgaga	ggaagaagct	ggcgagcaca	. aagtccatgg	acaccaacgg	900
cctcaagtgc	gccattgatc	acatcctgga	. ggcgcaggag	aagggagaga	tcaacgagga	960
caacgtcctc	tacatcatcg	agaacatcaa	. cgtcgccgcg	, atcgagacga	cgctgtggtc	1020
gatcgagtgg	gggatcgcgg	agctggtgaa	ccacccggag	r atccagcaga	agctgcgcga	1080

cgagatggac gcggtgctgg cccctacctg caagccgtga ggtgccgcac atgaaccttc caagatcctc gtcaacgcct ctcaggttc ctgcccttcg gcccatcctc ggcatcacca gggggtggac aagctcgaca ccactccacc atcgtcgcca ggtttgatgc tgtactctct gtctactaca gagtagatac gaactttttt aaaaaaacagt	tcaaggagac acgacgccaa ggttcctcgc tcctggagga gcgtcggccg tcggccgct ccaccgagaa agcccagagt tgcgtgcatg aagtttcgta	gctgcggctg gctcgccggc caacaacccg ggagaagcac ccggagctgc cgtgcagaac ggtggccag gttctgagtt tttgctcgtc tgttatctgc	cgcatggcta tacaacatcc gagcagtgga gtcgaggcca ccggggatca ttcgagctca ttcagcctcc ctgagttgcg ctaaaacctt	tecegetget cegeegagag agaggecega geggeaaega tectegeget ceaegeegee acatettgaa tgeagettet aattatgtat	1140 1200 1260 1320 1380 1440 1500 1560 1620 1680 1740 1775
<211> 1323 <212> DNA <213> Lolium perenne					
<400> 34 tectetegec gaegegetea gateacegge tgggeegee caggaggaeg ggegetgaag tgaeeteeae cagaecaaga tgaggtggta ggegaggtga egttgageag taetgeaaea geecaegeag ggeggetteg eccagegggg cagegege	gggacgccac atgtggtgct accaccttgg tggaggtcgg tcgttgggtg agaagatctg cctcctccat agcaggcggc	cggccacctc gaaggttctg tgctccaaaa gccggaggtg ctgccgcgac gtcgtacaac ggtcgtcgac gccgctgctg	tccccgtaca tactgcggca taccccatgg agcaagtaca tgccggccgt gacgtctaca cagaagttcg tgcgctggcg	cgtacaacct tctgccacac ttcccgggca gcgtcggcga gcaaggccaa ccgacggaaa tggtgaagat tcacggtgta	60 120 180 240 300 360 420 480 540
cagcccgctg aagcacttcg gggcggcgtg ggccacatgg gatcagctcc tccgacaagg cgacaccgtg cccgtcaagg caagctcgtc ctcatgggcg gctcgggagg aagaccatcg gctcaggttc tgcgtcgac cctcaaccag gcgcttgagg cgtcgcaggg agcaacatcg cctccattga gcgcgacaag tgtgaactgt gtgaatgtg tcaataggaa gaaatgttt	g gcgtgaaggt a agcgcgccga g cccagatggc c acccgctcga g tcattggcga c agggcagctt a agggcctcac g gctcgagcg ttccgtgaca ttccgtgaca	ggccaagtcc ggccatggac cgccgccatg gccctacctc gccgctcagc catcgggagc ctcgcagatc caacgacgtc cgcatgatca tatactcctc	atgggccacc gacctgggcg gactcgctgg gcgctgctca ttcgtgtccc atcgaggaga gaggtcgtca aggtaccgct acttggcacc aacttggttc tcagagtgtg	acgtcaccgt ccgacgccta actacatcat agatggacgg ccatggtcat ccgaggaggt agatggacta tcgtcgtcga gacgagcgaa aatacatgat catgttagtt	600 660 720 780 840 900 960 1020 1080 1140 1200 1260 1320 1323
<210> 35 <211> 1313 <212> DNA <213> Festuca arundi:	nacea				
<pre><400> 35 ggtcccaagc ccacccaat cgccgcegcg ctcagtgcc cgggtgggcc gccagggac gacgggcgct gaagatgtg ccaccagacc aagaaccac ggtaggcgag gtggtggag tggcgtcggg gtgatcgtc gcagtactgc aacaagaag gcagggcggc tccgcccc ggggctggcg actgaagcac cgtggccac cagctccaac cgtccctcaac cgtccctcatg ggcgtgatc gaggaagacc gaggaagacc aggagaagacc aggagaagacc aggagaagacc aggagaagacc agaggaagacc agaggaagacc agaggaagacc aacaccgggg</pre>	a agagaatggg a ccaccggtca g tgctgaaggt c ttggtgcctc g tcgggccgga g ggtgctgcca a tctggtcgta g ccatggtcgt g cggcgccgct a tgaccccag g cggagccaa a tggccgcaa a tggccgcaa a cgaggccaa a cgaggccaa a cgagcccaa a cgagcccaa a cgagcccaa a cgagcccaa a cgagcccaa	cagcytcgac catcytcccc tctytactyc aaaatacccc gytgagcaag cgactyccgg caacgacgtc cgaccagaag gctctgcggg gctctgcggg gcccatgggc cgacgactc	gcctccgaga tacacgtaca ggcatctgcc atggttcccg tacagcgtcg tacaccgacg ttcgcggtga ggggtgacgg ggcatcctgg caccacgtca gggcgccgacg ctcgactaca tcgactaca tccccatgg	agacgatcac coctcaggag acactgacct gcatgaggt gcgacgttga gcaagccaac agatcccggc gcctcggcgg ccgtgatcag cctacctcgt tcatcgacac acggcaagct tcatggcaggt tcatggcaggt tcatgcagg	60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020

gttctgcgtc gaaaagggcc ccacgccctt gagaggctcg tgggagcaac atcaaggacg gcgataattt ccgtgacata gtgaatttgt ttccgtcttc	agcgcaacga ccgacgcctg tgctcctcaa	cgtcaggtac atcgacttgg ctcggtgcag	cgcttcgtcg aacctactcc tacatgattg	tcgacgtcgc aagatagagc tgacctgtgt	1080 1140 1200 1260 1313
<210> 36 <211> 1059 <212> DNA <213> Lolium perenne					
<pre><400> 36 gcaatcatcc agcccagatc accacggcgg ctgatgccac gccagcggtg agcgacgcgc tctaccagta atgaagcagc tccgcgagga gacgagggcc agttcctcaa atcggcgtct acaccggcta acgatcttgg ccatggacat gagaaggccg gcgtcgcgca gacaaggaca ctctcggcta acgactgc tcgaggacga gacaaggaca actacccaa cttctcggct acagcacac atgcgcaagt gcgtcggca gcagacgc gcgtcgagat ccatggatg cggtcgagat tcgagacgac tcttgagaac actctttggatg cggacaagaa tcctgtatct tcttggaaac agacaaataa tattactcct</pre>	ggccacggtt cacccgccac catcctggag caccgccaac cctgctcatc ctccctcctc caaccgcgag caagatcgac ggccaaccac ctaccaccag gctctggaac ctaccgcgac ctgccagctc ttgatgacgc ttgattaatt aaatattgtc	gccaaggagc tccgaggtcg accaccgtgt cacccatgga aagctcatcg gccaccgcgc actacgagg ggcacctcg cgcctcatga ggatccgtcg ttcgtcctcg cccgtcggcg gagcgccc attatccc cctttatgta	agaccaccac ggcacaagag accegegega acctgatgac gegccaagaa tegecatece ccateggcaa ggccegeget acttegtett agetegecag tgeteceege agettaacaa acggcatcac ccecetegge attttgeegt	caacggcgcc cctgctccag gcacgagtgc cacgtcggcg gaccatggag cgaggacggc gccgtgcatc cccggtgctc cgtcgacgcc ggtcggcgcc cgacgccc cgacgccc cgcctcgcc cctctgccgc tctggcttc	60 120 180 240 300 360 420 480 540 600 720 780 900 960 1020 1059
<212> DNA <213> Festuca arundina	acea				
<pre><400> 37 ggtcgactca gcaagacagc gctaaagacc ggcaatggcg agcccgccac caacggcgcc gcacaagag cctgctccag acccgcgcga gcacgagtgc acctgatgac cacgtcggcg gcgcaaagaa gaccatggag tcgccatccc agaagacggc ccatcggcaa gccgtgcatc ggccgcgct acttcgtctt cgtcgacgcc agctcacaca ggccgcgcc agctcacaca ggccctcgcc acggcatcac cctctgccgc cccctctgc tccgctcat</pre>	accacggcgg gccagcggtg agegacgcgc atgaagcagc gacgaggcc atcggcgtct acgatcttgg gagaaggccg gacaaggccg gacaaggaca ctcatcggct atgcgcaagt gcagacgacc cqcqccaagt	ctgatgccac ccgagcaggt tctaccagta tccgcgagga agttcctcaa acaccggcta ccatggacat gcgtggcgca tcgaggacga actacctcaa acgacaacac acgtcgagat gcgtcgagat gcgtcgagat gattgtctga	ggccacggtg caccgccac catcctggag caccgccaac cctgctcatc ctcctccaacgggg caagatcgac ggccaaccac ctaccaccag gctctggaac ctaccgcgac ctaccagctc ttgatgacgc	cccaaggage tccgaggteg accaccgtgt cacccatgga aagctcateg gccaccgcgc aactacgaga ttccgcgagg ggctccttcg cgcctcatga ggatccgtag ttcgtcgtcg cccgtcggcg tcgcgcgcg	60 120 180 240 300 360 420 480 540 660 720 780 840 900 960

tttcttgctt aatttatatc	tcttctgtat cagacaaata	cttcttggaa atattactcc	acaaatattg tataaaaaaa	tccttttatg aaa	tacgtataca	1020 1063
<210> 38 <211> 1333 <212> DNA <213> Loliu	um perenne					
tgtcetegac gaacacccgt cgccgccgcc cgccgccggg caagggcacc cgccatcgac gcaaatggtg cggcacggtg ccgcgggccg aaccaggaac gcagcacgcc ccgcgcgacg caagttcgcc ccgcgagac gtgctctc ccgcgagac gtgctcgac gtgctcgac gtgctcgac	taccaaaccg cccgcctcac cccatattaa gccgcggtgg tacatcgcgt gtcaggaacc cggctggtcc ggctgccacg gagccggcgg cggcggatgg cggcggatgg tggtactgct ggcgtggacc gtgaacgcaa aacgccgtgc gatgtgcgca gatgtgcgca gtcgtgcgca gtcgtgcac ctcgagttca ggcaccttc ctgcaggcag tactgtcatg	cgccggccgg ctatcaacat cgcggcccgc cctggctcgt cagacgaccc tctgcaaggc gcgtcttcca tgaggggcac tgctcacctc tcgacgagtc acgggaaggc ttgtggtggt gcatcggcca aggcgtacgt cctcgccaa cgaggaagca gcgttccgg tcctcgccaa cgaggaggaga cggtgctcag gggttaccat	ttetecgete gacagtegte egggaacggg caagetgetg gaagaacgeg egaceteete cacegeatee geagtacgte etecategge gtgetggage ggttgeggag gaacceggtg catecteaag ggacgececte getetteece gceatacaag ecagtecete egecatacaag ecagtecete eggagagga ecagtecete eggagagga ecagtecete eggagagga	cgagctatac gaggtcttag cagaccgtgt ctggagaagg cacctgaggg gactacgacg ccagtcactg atagacgcgg gccgtcacca gacctcgact caggcggcat ctggtgatcg tacctggacg gacgtggccg atgtcaccca gacgtggcg atgtctaacc tacgagacg gaggcggaca gaggcggaca ggagcagaca	gtccgtccga ctgccggcga gtgtgaccgg ggtacactgt cgctcgacgg ccatccgcg acgaccccga cggcggaggc tgcaccccaa tctgcaagaa cggagttggc gcccctgct ggtcggccag acgcccacct gctcctcca tcccacaag agaagctcca tgaagagcct atgaagagcct atgaagacct atgaaaccct	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260 1320 1333
<210> 39 <211> 1237 <212> DNA <213> Fest	uca arundin	acea				
acaagtacag tgcctggcca tcgtcaagct atcccaagaa aagccgacct tccacaccgc gcacggagta cgtcgtcaat agtcctgctg aggccgtggc tcgtgaaccc cacacatcct acgtagacgt cgggccggta gcaaacctta agcagcctta tgaacgactc caagcaaacc ttcacgtgct	gttcttctgt tggtactgta tgggcagacc gctcctggag cgccacctg cctcgactac cctccagtc cgtgatcaac cggtgccatc gagcgactc gagcgactc ggagcagct tgtgctcgtg caagtacctc gcgtgacgta cctctgcgcc cctgagtac tagatgtcc tctgtatgag agagggatta cctgtaacat tttaagtgaa	agagcaacaa gtgtgcgtca agaggctaca aaggcgctgg gacgccatat accgatgatc gcggcagcgg accatggacc gaattctgca gcgtgggagg gtagggccgc gacggctcgg gcggcgcgc gaggcgcgc cctgtgccaa aaccaaaagc accgtaaaga aacggtgtaa ggtcaaacat	tgaccgttgt ccggcgccgc ccgtgaaggg acggcgccac gcgccgccgt ctgagcagat atgcgggaac ccaaccgcgg agaaaaccaa cggccaggaa tgctgcaacc ccaagaagta acatccggtg caaggtgctc tgcaggatct gcctccagga cggcatgata gagttgttt	cgacgccgcc ggggtacatc cacagtgagg cgagaggctgc ggtggagccg ggtgcgcgg tcctgacgta gaactggtac gcgcggcatc acggtgaac gtcgagctg tctgaggta tcgagcgt gtcgagct gttcgaggcg ggacgttgt tgatgaagtg tggcctccag gaagggacat ctgctaaaaa	gcgccgcagc gcgtcggggc aacccagatg atcctctgca cacggcgtgt gcggtgcggg gtggtgttca gtcgtcaatg tgctacggca gacctcgtcg gctagcgccg gtgcagtcat cctgaggcgt caaatcctca aacccacgga ttcactcctg ctcctagtac	60 120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020 1080 1140 1200 1237
<211> 1429 <212> DNA	uca arundin	acea				

//nn> //n						
<400> 40	ggcagacgca	gagatcgatg	aattccacca	ccaccaacat	aaccacatcc	60
getetegate	aggcgtgcat	gagaccgatg	carctcrcct	cctcatcaat	cctcccgatg	120
geegaeeagg	acgccatcga	getegeeete	ctgacatac	taataaccac	caacaacaaa	180
acgcigaaga	ccaccgaggt	geeeggeeee	ctcccctccc	caacasaccc	adaaacacca	240
Legetgaeee	accgcatgct	ggccgccaag	aggtagtag	acatcatasc	atacctaata	300
gacatggtgg	accgcatgct	ceggergere	gegregraca	acgregaçat	gtgcccggta	360
gaggagggca	aggacgggcg	ecteteeegg	ageracggeg	ccgcgcccgc	gegeaageee	420
ctcaccccca	acgaggacgg	cgtctccatg	geggegeteg	ttanagaga	catccccttc	480
gtcctcatgg	agagctggta	ctacctcaag	tagagggccc	ccgacggcgg	cttcaaccc	540
aacaaggcgt	acggcatgtc	ggcgttcgag	Laccacggca	eggaccegeg	catagaacta	600
gttttcaacg	aagggatgaa	gaaccactee	atcatcatca	ccaagaagct	aggaggage	660
taccacggct	tccagggcct	cggcaccctc	gregacgreg	geggeggegt	egtegeeace	720
gtggccgcca	tegeegeeca	ctaccccgcc	accaaggggg	teaacticga	cottcttctac	780
gtcatctccg	aggcgccgca	gttcccgggc	greacceacg	taggeggega	catgittaag	840
gaggtgccct	cgggcgacgc	catcctcatg	aagtggatee	Lecaegaetg	gagegaceag	900
cactgcgcca	cgctgctcaa	gaactgctac	gacgcgctgc	eggegeaegg	caaggicgig	960
ctcgtcgagt	gcatcctgcc	ggtcaacccg	gaggccaagc	ccagcicgca	gggggtette	1020
cacgtcgaca	tgatcatgct	cgcgcacaac	cccggcggca	gggagaggta	cgagagggag	1020
ttcgaggccc	tggccagggg	agctgggttc	accggcgtca	agtecaegta	catclacgca	1140
aacgcgtggg	ccatcgagtt	caccaagtag	atgagatccc	teeggeetee	atgcatccag	1200
gcaacctccc	cccgatatga	gaacgatcgt	cgtcgatttt	gctggctgct	gcctttgctc	
ctgcatcgat	ttgcaaacgg	accetttggt	tggtttttcc	tctgttttcc	ctaattttt	1260
catgctctga	attttgaatt	ttgatggctg	ggtcgtcgat	ctgctcggaa	atgttttgaa	1320
aaggttgggt	atgttggaaa	cttgtatgtg	atgtaatgag	atgattttt	tcctttgttg	1380
aaaactcgag	taaattgaag	tgactttcat	cttcctttga	aaaaaaaa		1429
<210> 41						
<211> 1457						
<212> DNA						
<213> Loli	um perenne					
<400> 41			1			60
gctctcgctc	acaccaaaat	cgcccaccag	caccagcatc	tctcgatcgg	cagacgcata	60
gctctcgctc gatcgatggg	ctccaccgcc	gccgacatgg	ccgcgtccgc	cgacgaggac	gcgtgcatgt	120
gctctcgctc gatcgatggg tcgccctcca	ctccaccgcc gctcgcttcc	gccgacatgg tcgtcggtcc	ccgcgtccgc tcccgatgac	cgacgaggac gctgaagaac	gcgtgcatgt gccatcgagc	120 180
gctctcgctc gatcgatggg tcgccctcca ttggcctcct	ctccaccgcc gctcgcttcc ggagatcctg	gccgacatgg tcgtcggtcc gtggccgccg	ccgcgtccgc tcccgatgac gcggcaagtc	cgacgaggac gctgaagaac gctgaccccg	gcgtgcatgt gccatcgagc accgaggtgg	120 180 240
getetegete gategatggg tegeceteca ttggeeteet eegecaaget	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga	cgacgaggac gctgaagaac gctgaccccg catggtggac	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc	120 180 240 300
getetegete gategatggg tegeceteca ttggeetect eegecaaget	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg gtcgtgacgt	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc	120 180 240 300 360
getetegete gategatggg tegeeeteea ttggeeteet eegeeaaget ggetgetege teteeeggag	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg gtcgtgacgt gcgcccgtgt	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag cacccccaac	gegtgeatgt gecategage acegaggtgg egeatactee gaeggeegee gaggaeggeg	120 180 240 300 360 420
getetegete gategatggg tegeeeteea ttggeeteet eegeeaaget ggetgetege teteeeggag	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag cacccccaac cctcatggag	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact	120 180 240 300 360 420 480
getetegete gategatggg tegeeeteea ttggeeteet eegeeaaget ggetgetege teteeeggag teteeatgge acctcaagga	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcggca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag cacccccaac cctcatggag caaggcctac	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg	120 180 240 300 360 420 480 540
getetegete gategatggg tegeeeteea ttggeeteet eegeeaaget ggetgetege teteeeggag teteeatgge accteaagga	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg cgcggtcctt	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccgcgct	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga	120 180 240 300 360 420 480 540
getetegete gategatggg tegeceteca ttggeetect eegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta accaetecat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg cgcggtcctt ccacggcaccg catcatcacc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg	120 180 240 300 360 420 480 540 600 660
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta accaetecat geageetegt	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg cgcggtcctt ccacggcacg catcatcacc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcggca gacccgcgct aagaagctcc ggcggcgtcg	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact	120 180 240 300 360 420 480 540 600 660 720
getetegete gategatggg tegeceteca ttggeetect eegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta aceactecat geageetegt aceceaceat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg ccacggcacg catcatcacc cgacgtcggc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aacttcgacc	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt	cgacgaggac gctgaagaac gctgaccceg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgcccact gcgccgcagt	120 180 240 300 360 420 480 540 600 660 720 780
gctctcgctc gatcgatggg tcgccctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt accccaccat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgctcgcg cgcggtcctt ccacggcacg catcatcacc cgacgtcgcg catcatcacc cgacgtcgg	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tcccccacgt	cgacgaggac gctgaagaac gctgacccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgcata catctccgag ggtgcctcg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgca	120 180 240 300 360 420 480 540 600 660 720 780 840
gctctcgctc gatcgatggg tcgccctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt accccaccat tcccggcgt	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgcg cacgacgtcgc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga cacgactgga	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tcccccacgt tgttcaagga gcgaccagca	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgactac ggccgccata catctccgag ggtgccctcg ctgcgccacg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggca agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgccact	120 180 240 300 360 420 480 540 660 720 780 840 900
gctctcgctc gatcgatggg tcgccctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt accccaccat tcccgggcgt tctcatgagaa	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgcg catcatcacc cgacgtcgc	gccgacatgg tcgtcggtcc gtggccgccg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcggca gacccgcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga qcqcacggca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tcccccacgt tctcaagga gcgaccagca aggtcgtgct	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa cacggcttc ggccgccata ggtgcctcg ctgcgccacg ctgcgccacg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgcccact ggagacgcca ctgctcaaga atcctgcgg	120 180 240 300 360 420 480 540 660 720 780 840 900 960
gctctcgctc gatcgatggg tcgccctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt accccaccat tcccgggcgt tctctcatgga acttcaatga acactccat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcggc cacacggcgcc caccacgtc caccacgtc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcggca gacccgcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tctcccacgt tgttcaagga gcgaccagca aggtcgtctca	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa cacggcttc ggccgccata gatgcctccg gtgccctcg ctgcgccacg cgtcgagtgc cgtcgacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgcccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020
gctctcgctc gatcgatggg tcgccctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt acccaccat tcccggcgt tctctcatgas actcaagas actcaagas accaccacat	ctccaccgcc gctcgcttcc ggagatcctg cccgtcgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcggc caacggcggtc caacggcgcc caacggcggtc caccacgtc gcgcgtcccc gcggctgccc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aactcgacc ggtggcgaca cacgactgga gcgcacggca agctcgcagga	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgct tcgagctcta gcgccaccgt tccccacgt tgttcaagga gcgaccagca gcgtcttcca aggtcgtcta	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggctac cttcaacgaa cacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccatggctctc	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg ggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccagggag	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
gctctcgctc gatcgatggg tcgcctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt acccaccat tcccggcgt tctcatgaa actgctacga tcacccaccat	ctccaccgcc gctcgcttcc ggagatcctg cccgtcgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcggc caacggcggtc caccacgtc gcgcgtcctc gcgcgtcccc gcggctgcg	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aactcgacc acgactgga gcgcacgca agctcgcac gcgacggca tcacgac	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcatggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgct tcgagctcta gcgccaccgt tccccacgt tgttcaagga gcgaccagca aggtcgtcca aggtcgtcca aggtcgtcca agaggagtt tctacgcaa	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgacatg cgtcgacatg ccgtcgacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg ggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca gcaggggag atcatgctca	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
gctctcgctc gatcgatggg tcgcctcca ttggcctcct ccgccaagct ggctgctcgc tctcccggag tctccatggc acctcaagga cgttcgagta accactccat gcagcctcgt acccaccat tcccggcgt tctcatgaa actgctacga tcacccacca	ctccaccgcc gctcgcttcc ggagatcctg cccgtcgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcggc caacggggtc caccacgtc gcggtcctc gcgcgtcccc gcggcgcaatccc cggcggcaatccc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccgcgct aagaagctcc ggcggcgtcg aactcgacc ggtggcgaca cacgactgga gcgcacggca gcgcacggca tccacgtaca cacgactcacac gaaggtacc	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcatggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccaccgt tgttcaagga gcgaccagca aggtcgtct agggctttcca agaggagtt tctacgccaa ggcaacatgt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgactgc ccgcgtggcc cccccgata	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacggcg agctggtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgca ctgctcaaga atcetgccgg atcatgctcg gccaggggag atcatgctc gcaggggag atcgagttca tgagaacgat	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
getetegete gategatggg tegeceteca ttggectect cegecaaget ggetgetege tetecatgge aceteaagge aceteaagge aceaetecat geagectegt aceceaecat teeegggegt teeteatgaa actgetaega teaaecegga egeacaaece ceggattaae . ccaagtagat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgcg cacgcgtcgc cacggggtc cacgggggtc cacgggggtc caccacgtc ggggtcctc ggggtcctc ggggtcctc ggggtcgtcagg gcgatcacc cggcggcagg	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca agctcgcagg gagaggtacg tccacgtaca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgttcaagga gcgaccagca aggtcgtctca agagggagtt tctacgcca agagggagtt tctacgcca	cgacgaggac gctgaagaac gctgaccccg catggtggac gagggcaag caccccaac catcatggag caaggcctac cttcaacgaa ccacggcttc ggccgcata catctccgag ggtgccctcg ctgcgccacg cgtcgagtgc ccgcgatgc ccaggctcc cccccgata gatcaccctt	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggcgccg agctgctact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgctg gccaggggag atcgagttca gccaggggag atcatgttcg gccaggggag atcgagttca tggagattca tggagattca tggagatcgat	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege tetecatgge aceteaagga egttegagta accaetecat geageetegt acceaceat tecegggegt teeteatgaa actgetaega teaaceegga egeacaacee eggateae egeacaacee eggateae egeacaacee eggateae egeacaacee eggateae egeacaacee eggategtegt tecteagat teaaceegga egeacaacee eggateae eggategtegat tectetegat	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctc ccacggcacc caacggcgcc caccacgtc caccacgtc ggcgtcctc caccacgtc cgcgctgccg cgcgctgccg cgcgctcaag cgcgctcaag ccttggcgcagg cgcgctcaag ccttggtggc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgct aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca cacgactgga gcgcacggca cacgactgca gcgcacggca cacgactgca gcgcacggca tccacgtaca caagcatcca gctgccgctg	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgttcaagga gcgaccagca aggtcgtgct gggtcttcca agagggagtt tctacgcaa ggcaacatgt tctcctgcatc	cgacgaggac gctgaagaac gctgaccccg catggtggac gagggcaag caccccaac cctcatggag caaggctac cttcaacgaa ccacggcttc ggccgcata catctccgag ggtgccctcg ctgcgccacg cgtcgactgc cgtcgactgc cccccgata catcacctt tctgaattt	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacggccgcc gaggacgtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgtcg gccagggaga atcgtcatgctcatgctcatgctcatgctcatgctcatgctcatgctcatgctcatgctcatgctcatgctcatgagattcatgcttggttt aatggttggg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260 1320
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta accaetecat geageetegt acceaceat teceggggt teeteatgaa actgetaega teaaceegga egeacaacee eggatteae ceggatteae ceggatteae ceaggatteae tectetgtt	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtccctc ccacggcacg catcatcacc caaggggtc caccacgtc gtggatcctc cgcgctgccg cgcgtccacg cgcgtccacg cctcgcgcagg cctctcccacgtc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgacatg ccacggcttc cgccgcata catctctcacgag gttcccccccccc	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta accaetecat geageetegt acceaceat teceggggt teeteatgaa actgetaega teaaceegga egeacaacee eggatteae ceggatteae ceggatteae ceaggatteae tectetgtt	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctc ccacggcacc caacggcgcc caccacgtc caccacgtc ggcgtcctc caccacgtc cgcgctgccg cgcgctgccg cgcgctcaag cgcgctcaag ccttggcgcagg cgcgctcaag ccttggtggc	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgacatg ccacggcttc cgccgcata catctctcacgag gttcccccccccc	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgge aceteaagga egttegagta accaetecat geageetegt acceaceat teceggggt teeteatgaa actgetaega teaaceegga egeacaacee eggatteae ceggatteae ceggatteae ceaggatteae tectetgtt	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgcg caccacgtc ggcgtcctc cgcgctgccg gcgcgtcaac ctcggcggcagg cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgtgggtcatc ccttggtgggt ttccctaatt cgctcggaatg tgtgatgtaa	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgga aceteaagga egttegagta accaetecat geageetegt acceaceat tecegggegt teeteatgaa actgetaega teaaceegga egeacaacee eeggatteae . ceagtagat cetectetgat tegeegatet tegeegatet tegeegatet tegeegatet gaaacttgta	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgcg caccacgtc ggcgtcctc cgcgctgccg gcgcgtcaac ctcggcggcagg cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgtgggtcatc ccttggtgggt ttccctaatt cgctcggaatg tgtgatgtaa	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgga aceteaagga aceteaagga aceteatgat acceaceat teceggggt tecteatgaa actgetaega teaacegga tea	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctc ccacggcacg catcatcacc caaggggtc caccacgtc ggcgtcctc cacggcacgc gcgcgtccac cgcgctgccg cgcgctgccg cgcgtcaatccc ccggcgtcaatccc ccgcgcgtcaagg ccttgcggt ccaccacgtc cccggcgtcaag ccgcgtcaagg ccgcgtcaag ccgcgtcaatc ccttggtgggt ctccctaatt ccttggtgggt cttccctaatt cgctccgaaag cttgcgt	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgge aceteaagga aceteaagga aceteateat teceggggt tecteatgaa acecaceat teceggggt tecteatgaa actgetaega teaaceegga tea	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctc ccacggcacg catcatcacc caaggggtc caccacgtc ggcgtcctc cacggcacgc gcgcgtccac cgcgctgccg cgcgctgccg cgcgtcaatccc ccggcgtcaatccc ccgcgcgtcaagg ccttgcggt ccaccacgtc cccggcgtcaag ccgcgtcaagg ccgcgtcaag ccgcgtcaatc ccttggtgggt ctccctaatt ccttggtgggt cttccctaatt cgctccgaaag cttgcgt	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gtcgtgacgt gcgcccgtgt ctcatgaacc gacggcgcat aagaagctcc ggcggcgtcg aacttcgacc ggtggcgaca cacgactgga gcgcacggca tcacgactgca gcgcacggca agctcgcagg tcacgcacg tcacacgactcaca caagcatcca	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgga aceteaagga aceteaagga teceaetecat geageetegt tecteatgaa aceceaecat tecegggggt tecteatgaa actgetaega teaaecegga	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctt ccacggcacg catcatcacc cgacgtcgg caccacggcagg caccacgtc gtggatcctc cgcgctgccg ggccaatccc cggcgtcaag cgcggtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgcgtcaag cgtggtcaag cgtggtcaag cgtggtcaag cgtggtcaag cgtggtcaag cgtggtcaag cgtggtaag cgtggtcaag cgtggtcaag cgtggtaag cgtggtcaag cgtggtcaag cgtggtaag cgtggtaaag cgtggtaaag cgtggtaaag cgtggtaaag cgtggtaaag	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccggcgt aagaagctcc ggtggcgaca cacgactgga gcgcacggca gagctcgcagg gagaggtacg tccacgtaca caagcatcca gctgccgctg tttcatgac ttacattaaa tgaaatgatt	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
getetegete gategatggg tegeceteca ttggeetect cegecaaget ggetgetege teteceggag tetecatgga aceteaagga aceteaagga teceaetecat geageetegt tecteatgaa aceceaecat tecegggggt tecteatgaa actgetaega teaaecegga	ctccaccgcc gctcgcttcc ggagatcctg cccgtccgcg gtcgtacaac ctacggcgcc ggcgtcctc ccacggcacg catcatcacc caaggggtc caccacgtc ggcgtcctc cacggcacgc gcgcgtccac cgcgctgccg cgcgctgccg cgcgtcaatccc ccggcgtcaatccc ccgcgcgtcaagg ccttgcggt ccaccacgtc cccggcgtcaag ccgcgtcaagg ccgcgtcaag ccgcgtcaatc ccttggtgggt ctccctaatt ccttggtgggt cttccctaatt cgctccgaaag cttgcgt	gccgacatgg tcgtcggtcc gtggccgcg gcgaacccgg gcgaacccgg gtcgtgacgt gcgccgtgt ctcatgaacc gacggcgca gacccggcgt aagaagctcc ggtggcgaca cacgactgga gcgcacggca gagctcgcagg gagaggtacg tccacgtaca caagcatcca gctgccgctg tttcatgac ttacattaaa tgaaatgatt	ccgcgtccgc tcccgatgac gcggcaagtc aagcgccgga gcctggtgga gcaagttcct aggacaaggt tcccgttcaa tcaaccgcgt tcgagctcta gcgccaccgt tccccacgt tgtcaagga gcgaccagca aggtcgtgct aggagctcaa cggtctcca agggagct tctacgcaa ggtcttcca agagggagtt tctacgccaa aggcaacatgt tctcctgcatc ttaaaaccat aacgatgttt	cgacgaggac gctgaagaac gctgaccccg catggtggac ggagggcaag caccccaac cctcatggag caaggcctac cttcaacgaa ccacggcttc ggccgccata catctccgag ggtgccctcg cgtcgactgc cgtcgactgc cgtcgacatg ccacggcttc cgcgcacatg ccatgcttc cgctgacatg ccatgcttc tcgatggcc ccccccacatg	gcgtgcatgt gccatcgagc accgaggtgg cgcatactcc gacgacgccgcc gaggagtact ggcatgtcgg gggatgaaga gagggtctcg gccgccact gcgccgcagt ggagacgcca ctgctcaaga atcctgccgg atcatgctcg gccaggggag atcatgctca tgctcaggag atcgagttca tgcttggttt aatggttggg gggtatgttg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440

```
<400> 42
gctcgctcac accaaaatca cccaccagca ccagcatctc tcgatcggca gaggcagaga
                                                                      60
                                                                     120
tegatggget ceacegeege egacatgace gegteegeeg aegaggagge gtgeatgtte
                                                                     180
qccctccage tegectecte gtegatecte cegatgaege tgaagaaege categagett
ggcctcctgg agatcctggt ggccgccggc ggcaagtcgc tgacccccac cgaggtggcc
                                                                     240
                                                                     300
gccaagctcc cgtccgcggc gaacccggaa gcaccggaca tggtggaccg catgctccgg
ctgctggcgt cgtacaacgt tgtgtcgtgc ctggtggagg agggcaagga cggccgcctc
                                                                     360
                                                                     420
tcccqqaact acggcgccgc gcccgtgtgc aagttcctca cccccaacga ggacggcgtc
                                                                     480
tocatggcgg cgctcgcgct catgaaccag gacaaggtcc tcatggagag ctggtactat
ctgaaggacg cggtccttga cggcggcatc ccgttcaaca aggcgtacgg catgtcggcg
                                                                     540
                                                                     600
ttcqaqtacc acqqaacqqa cccqcqcttc aaccqcqtqt tcaacqaaqq gatqaaqaac
cactccatca tcatcaccaa gaagctcctc gagctctacg acggcttcca gggactcggc
                                                                     660
accetegteg aegttggegg eggegtegge gecaeegtgg eegecateae egeceaetae
                                                                     720
                                                                     780
cccgccatca agggggtcaa cttcgacctc ccccacgtca tctccgaggc gccgccgttc
ccgggcgtca cccacgtcgg cggcgacatg ttcaagaagg tgccctcggg cgacgccatc
                                                                     840
                                                                     900
atgatgaagt ggatcctcca cgactggagc gaccagcact gcgcaacgct gctcaagaac
tgctacgacg cgctgccggc gcacggcaag gtggtgctgg tggagtgcat cctgccggtg
                                                                     960
aacceggagg ccaageccag ctegeagggg gtgttccacg tegacatgat catgetegeg
                                                                    1020
                                                                    1080
cacaaccccq qcqqcaqqqa gaggtacqaq agggagttcg aggccctcgc caggggagct
gggttcgctg gcgtcaagtc cacatacatc tacgccaacg cctgggccat cgagttcacc
                                                                    1140
                                                                    1200
aaqtaqatqa qatccctcca tccaqqcaac ctcccaccga aatgagaatc gtgggtattc
gatettgetg getgetgeeg etgeteetge ategatetge atacgtacce tttgettggt
                                                                    1260
                                                                    1320
ttttcctctg ttttccgtaa ttttctcatg ctctgaatcc attctgaatt ctaatggttg
                                                                    1380
tgtcgtcgat ctgctcggaa tgtaccatta ataatgctgt tctgaaaagg ttgcatatgt
tgtatatgat 'gtaatggcat gatttctctc ctttgttgaa tataccagta cattgaagtg
                                                                     1440
                                                                    1452
tcaaaaaaa aa
<210> 43
<211> 1440
<212> DNA
<213> Lolium perenne
<400> 43
qctcqqqtct ctcqctcata ctaccaaaaa cacccagcag cacaccagcg tctctcggcc
                                                                       60
                                                                      120
caggagaagc agacacaggc agagatgggc tccaccgcag ccgaaattgc cgcgtccgcc
gacgaggagg cgtgcttgta cgccctccag ctcggctcgt cgtcgatcct cccaatgacg
                                                                      180
                                                                     240
ctgaaqaaca ccatcgagct tggcctcctg gagaccctca tggccgccgg cgggaagtcg
                                                                      300
ctgacccca ccgaggtggc cgcaaagctc ccgtgcgcag cgaagaaccc ggaagcacca
gacatggtgg accgcatgct ccggctgctg gcgtcgtaca acttagtgtc gtgccttgtg
                                                                     360
                                                                      420
gaggagggta cggatggccg cctctcccgg cggtacggcg ccgcgccggt gtgcaagttc
ctcaccccca acgaggacgg cgtctccatg gcggcgctcg cgctcatgaa ccaggacaag
                                                                      480
gtcctcatgg agagctggta ctacctgaag gacgcggtcc ttgacggcgg catcccgttc
                                                                      540
                                                                      600
aacaaggcgt acggcatgtc ggcgttcgag taccacggca cagacctgcg cttcaaccgc
gtgttcaacg aagcgatgaa gaacaattcc atcatcatca ccaagaagct cctccagctc
                                                                      660
                                                                      720
tacgacggct tccagggcct cggcaccctc gtcgatgtcg gcggcggcgt cggcgccacc
                                                                      780
gtggccgcca tcaccgcaca ctaccccacc atcaagggga tcaacttcga cctcccccac
gtcatctccg aggcgccgcc attcccgggc gtcacccaca tcggcggcga catgttcaag
                                                                     840
                                                                      900
aaggtgccct cgggtgacgc catcctgatg aagtggatcc tccacgactg gagtgaccag
                                                                      960
cattgcgcca cgctgctcaa gaactgctac gacgcgctgc cagtgcacgg taaggtggtg
                                                                     1020
ctggtggagt gcatcctgcc ggtgaacccg gaggccaagc ccagctcgca gggggtgttc
cacgtcgaca tgatcatgct cgcgcacaac ccaggcggca gggagaggta tgagagggag
                                                                     1080
tacgaggcgc tcgccagggg agctggcttc gccggcttca agtccacata catctacgcc
                                                                     1140
aacgcctggg ccatcgagtt caccaagtag acgagaatca tgggtcttcg atcttgctgg
                                                                     1200
atgctgctgc tgctccttcg gtcaatctgc atgtgtaccc tttgcttggt atttcctctg
ttttccataa ttttctcatg ctctgaatct attccgaatt ctgatggctg tcgtcgatct
                                                                     1320
gctcggaatg taccattaat aacgctgttc ggtaaaggtt gcatacagta tgttgtatgt
                                                                     1380
1440
<210> 44
<211> 2102
<212> DNA
<213> Lolium perenne
<400> 44
gcatcaacct aaaacccacg ctatccaaca ccccctagag aaaaacaaaa acaaaaagat
                                                                       60
tacagttcct ggtttgagta tcaatcgatg gtgggcttcg ctaagatcgc catggagtgg
                                                                      120
```

atccaagatc	cactgagetg	gctgttcatc	gcctccgtgg	ttttcgtggt	tctgcagcgg	180
caacaacaaa	acaacataac	gccgtttccc	ccaaacccaa	aaccgctgcc	gatcgtcggc	240
aacatotooa	taataaacca	gctcacccac	cataacctaa	caacactaac	gaaggagtac	300
aacacgccga	tanagataa	gctcggtaag	ctccacacct	ttaccatatc	gacgccagag	360
ggeggeeeee	besteen	gctcggtaag	ccccacactcc	casaccatca	cacaaccata	420
tatgcccggg	aggigeigea	ggtgcaggac	ggtgccttct	terrener	cgcgaccatc	480
gccatcgcgt	acctcaccta	cgaccgagcc	gacatggcgt	tegegeaeta	egggeeerre	
tggcgccaga	tgcgcaagct	gtgcgtgatg	aagctcttca	gccggcgccg	cccggagacg	540
tggctcgccg	tgcgcgacga	gtccgcggct	ctcgtccgcg	ccgtggccag	gcggaccggc	600
gagtccgtgg	acctcggcga	gctcattttt	aaactcacca	agaatgtcat	cttccgcgcc	660
acattcaaaa	ctaatacaat	cgccgccgac	accaaaaaaa	gcgacggagc	agggaagcag	720
gegeeeggag	tcaccatact	ccaggagttc	tccaagetet	tcaacacctt	caacatcgga	` 780
gacgagetea	ccgccatccc	ctgggcggac	caacaaaaca	tcaacataca	cctccacaca	840
gactteatee	cgrggcrgag	ctgggcggac	ccycayyyca	nagagagat	cccccgcgcc	900
gcgcgcaacg	ccctcgacga	gttcatcgac	aagatcatcg	acgagcacat	ggagaggggc	960
aagaatcccg	atgatgccga	tgccgacatg	gtggacgaca	tgctcgcgtt	cctcccggag	
gcgaagccga	agaagggcgc	cgccggcgac	ggcgtggacg	acctgcagaa	cacgctccgc	1020
ctcacccgcg	acaacatcaa	ggccattatc	atggacgtga	tgtttggcgg	gacggagacg	1080
ataacatcaa	cgatcgagtg	ggcgatggcg	gagatgatgc	acaqccccga	cgacctccgc	1140
cacatacsac	addadctcdt	cgacgtggtg	gaactcaacc	ggaacgtgga	cgagtcggac	1200
cycccycayc	taggagetege	caagtgcgtc	atcaaccaca	cactccaact	acaccacac	1260
ctcgacaagc	LOCOCCUCCU	caagigcgic	accaaggaga	tarrarrata	gtaccegece	1320
atcccgctgc	tcctccacga	gaccgccgag	gactgcgtcg	Leggeggela	ccccg cgccc	1380
cggggctccc	gcgtcatgat	caacgtctac	gccatcggcc	gcgaccgcag	ggcgtggaag	
gacgccgacg	tgttccggcc	gtcgcggttc	gtgcaggggg	aaggggaggc	cgccgggctc	1440
gacttcaagg	ggggatgctt	cgagttcctg	cccttcgggt	caggccgccg	ctcctgccct	1500
aacataacac	teggeetgta	cgcgctggag	ctcaccataa	cgcagctcgc	gcacggtttc	1560
adctadaaac	tacccascaa	gatgaagccg	tcagaactag	acatgagcga	catcttcaac	1620
agetgggage	cgcccgacgg	caggetette	accatacces	caccacacat	cacatacaca	1680
Cicacogoco	cycycyccac	caggetetee	gccgcgccca	ggggggttggt	atattaacaa	1740
cagctgctgg	gagetgaega	caccadacac	caggegrgae	ggccarrgcr	tettengean	1800
gcgatcgatg	gtatatgtac	cagctggccg	gaagatgaag	gtgtttgata	tattcagagg	
tgatggcgga	ggcgccattg	gtggagcttg	gtggttttat	cttgcttttt	ttttactatt	1860
tttcttaaac	tttgaactca	attaagtctg	gtgacaacag	aacccaataa	gcggattatc	1920
atacttacta	gatgcatgct	tggatacagt	gttaagcatg	atgtgtttta	ccatgaagaa	1980
cacaaattat	aaaaacaaqt	ttttagacct	gctgccccga	gattctgtat	tttcttcctc	2040
ogodda a cogo			22	, , , , , , , , ,		2100
ttaattttaa	atcataaaaa	ctatattaat	accadataa	Tagtacccgt.	toaaaaaaaa	2100
ttggttttcc	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	
ttggttttcc aa	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	2102
aa	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	
aa <210> 45	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	
aa	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	
aa <210> 45	atcgtgagga	ctatattaat	gccaggatga	tagtacccgt	tgaaaaaaaa	
<pre>aa <210> 45 <211> 2051 <212> DNA</pre>	atcgtgagga uca arundin		gccaggatga	tagtacccgt	tgaaaaaaaa	
<pre>aa <210> 45 <211> 2051 <212> DNA</pre>			gccaggatga	tagtacccgt	tgaaaaaaaa	
<pre><210> 45 <211> 2051 <212> DNA <213> Fest</pre>			gccaggatga	tagtacccgt	tgaaaaaaa	
<pre>aa <210> 45 <211> 2051 <212> DNA <213> Fest <400> 45</pre>	uca arundin	acea				2102
<pre>aa <210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca</pre>	uca arundin	acea cacgcgatcg	aacaccccta	gaaaaaaaaa	caaaaacaaa	2102
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag</pre>	uca arundin acctaaaacc ttcctggttt	acea cacgcgatcg gagtatcaat	aacaccccta cgatggtggg	gaaaaaaaa cttcgctaag	caaaaacaaa atcgccatgg	2102 60 120
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag aqtqqctcca</pre>	uca arundin acctaaaacc ttcctggttt agaaccactg	acea cacgcgatcg gagtatcaat agctggctgt	aacaccccta cgatggtggg tcatcgcctc	gaaaaaaaaa cttcgctaag cgtggttttc	caaaaacaaa atcgccatgg gtggttctgc	2102 60 120 180
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg</pre>	uca arundin acctaaaacc ttcctggttt agaaccactg gcggggcaac	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt	aacaccccta cgatggtggg tcatcgcctc ttcccccggg	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg	2102 60 120 180 240
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg</pre>	uca arundin acctaaaacc ttcctggttt agaaccactg gcggggcaac	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt	aacaccccta cgatggtggg tcatcgcctc ttcccccggg	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg	60 120 180 240 300
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat</pre>	uca arundin acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg	2102 60 120 180 240
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agtggcggcg tcggcaacat agtacggcgg</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc	60 120 180 240 300
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgcgggaatatgcgggggggggg</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgqaggtg	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc	aacacccta cgatggtggg tcatcgctc ttccccggg cccaccgtgg ggaagctcca aggacggcgc	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga	60 120 180 240 300 360 420
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg	acea cacgcgatcg gagtatcaat agctggctgt gtggcgcgt gaccagctga atccggctcg ctgcaggtgc	aacacccta cgatggtggg tcatcgcctc ttccccggg ccaccgtgg ggaagctca aggacggcgc gagccgacat	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg	caaaacaaa atcgccatgg gtggttctgc ctgcgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc	2102 60 120 180 240 300 360 420 480
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc	acea cacgcgatcg gagtatcaat agctggctgt gitggcgccgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgc	aacacccta cgatggtggg tcatcgcctc tcccccggg ccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg	caaaacaaa atcgccatgg gtggttctgc ctgcgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg	60 120 180 240 300 360 420 480 540
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca agattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacgtqqct</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg	aacacccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagcgacat tgatgaagct cggcgctcgt	gaaaaaaaa cttcgctaag cgtggtttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cttcagccgg	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga	2102 60 120 180 240 300 360 420 480 540 600
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacgtggct gggaggtc</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtgcgc	acea cacgcgatcg gagtatcaat agctggctgt gtggcgcgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg	aacacccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagcgacat tgatgaagct cggcgctcgt	gaaaaaaaa cttcgctaag cgtggtttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cttcagccgg ccgcgccgtg	caaaacaaa atcgccatgg gtggttctgc ctgcgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc	2102 60 120 180 240 300 360 420 480 540 600 660
<pre>aa <210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcggcg tcggcaacat actacgcgc ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcggcgagtc gcgcgggtt</pre>	acctaaaacc ttcctggtt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtggccc	acea cacgcgatcg gagtatcaat agctggcgcgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca ggcgagtcca	aacacccta cgatggtggg tcatcgcctc tcccccggg ccaccgtgg ggaagctca aggacggcga tgatgaagct tgatgaagct tgatgaagct cggcgctcgt ttttaaact gcgacggcga	gaaaaaaaa cttcgctaag cgtggtttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cttcagccgg ccgcgccgtg caccaagaat cggcgacgga	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc gcagggaagc	2102 60 120 180 240 300 360 420 480 540 600 660 720
<pre>aa <210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcggcg tcggcaacat actacgcgc ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcggcgagtc gcgcgggtt</pre>	acctaaaacc ttcctggtt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtggccc	acea cacgcgatcg gagtatcaat agctggcgcgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca ggcgagtcca	aacacccta cgatggtggg tcatcgcctc tcccccggg ccaccgtgg ggaagctca aggacggcga tgatgaagct tgatgaagct tgatgaagct cggcgctcgt ttttaaact gcgacggcga	gaaaaaaaa cttcgctaag cgtggtttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cttcagccgg ccgcgccgtg caccaagaat cggcgacgga	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc gcagggaagc	2102 60 120 180 240 300 360 420 480 540 600 660
<pre> <210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacgtgct gcggcgagtt gcggcggtt aggcgggtt aggacgtt aggacgggtt aggacgagtt aggacgagtt aggacgagtt</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtgcgc cgtggcctc	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca gcgagtcca	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac ggcgttcagcggtcaccaagaat cggcgacggcccaccacagaat cggcgacgcgccccaccacgacttcggcgcccccaccaccacccccccc	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgcga cgccggccgg gccaggcgga gtcatctcc gcagggaagc ttcaacatcg	2102 60 120 180 240 300 360 420 480 540 600 660 720
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca agagtgctca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacggggt ggagggggt ggagggggt ggagggggt ggacggggt ggacggggt ggaggggt ggacggggt ggaggggt gggcgggtt aggacggtt aggacgagtt ggacggcgtt</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtggacctc cggcgctgt catcgccatc	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtccg gcggtccca	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct acccgcaggg	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac ggcgttcagcggcgtcaccaagaat cggcgacggccatcaacgtg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacggcg gccaggcgga gccaggcgga gtcatcttcc gcagggaagc ttcaacatcg cgcctccgcg	2102 60 120 180 240 300 360 420 480 540 600 660 720 780
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca agagtacaca agtacagagtacacat agtacggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacgtggct gcggcgagtt gcggcggtt gcggcgagtt gcggcggtt aggacgtt aggacgtgt aggacgtcat cctcat</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtgcgc cgtggacctc cggcgctgc cgtggacctc	acea cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtccg ggcgagctca gcggtcgcgc ctccaggagt agctggcgg	aacaccccta cgatggtggg tcatcgcctc ttccccggg cccaccgtgg ggaagctcca aggacggcaat tgatgaagct cggcgctcgt ttttaaact gcgacggcga tctccaagct acccgcaggg acaagatcat	gaaaaaaaaa cttcgctaag cgtggtttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cctcagccgtg caccaagaat cgcgcgacgga cttcggcgcc catcaacgtg cgacgagcac	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgccgga cactacgggc cgccaggccgg gccaggcgga gtcatcttc gcagggaagc ttcaacatcg cgcctccgcg atggagagg	2102 60 120 180 240 300 360 420 480 540 660 720 780 840 900
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cggaatatgc ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcgcgcgtt agacgtgct gcgcgcgtt agacgttacgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcg</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgtggacctc ccgcgtgcgc cctcgccctgcccc cgcgcctgcccccgcccccccc	cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc gacgagtccg gacgagtccg gacgagtccg gctgcaggtca	aacaccccta cgatggtggg tcatcgcctc ttccccggg cccaccgtgg ggaagctcca aggacggcgacat tgatgaagct cggcgctcgt ttttaaact gcgacggcga tctccaagct acccgcaggg acaagatcat tggtggacga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg cctcagccgg caccaagat cgcgcacgat cgcgcacgat cgcgacgac catcaacgtg cgacgagcac catcaacgtg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgcgga cactacgggc cgccggcgga gccaggcgga gtcatcttc gcagggaagc ttcaacatcg cgcctccgcg atggagaggg	2102 60 120 180 240 300 360 420 480 540 660 720 780 840 900 960
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctca agtggcggcg tcggcaacat agtacggcgg cgaatatgc ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcgcgcgtt agacgtggtt gcgcgcgcgtt agacgtgct cgccgcgtt agacgagtc ccaggcgagtc gcgcgcgcgt agacgagtc agacgagatc agacgaagacc agacgaagc</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgtggacctc ccgcgtggcc ccgtggacctc ccgtggcctgt catcgccatc ccgtggctgg	cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca gcggtcgcccagcgctca gcggtcgcgctca agctgggcgg	aacacccta cgatggtggg tcatcgctc ttccccggg cccaccgtgg ggaagctca aggacggcat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tcccaaggt acacgcaggg acaagatcat tggtggacga acggcgtgga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgtg catcaacgtg cgacgagcac catcaccgg cgacgagcac catgctcgcg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgcgc cgtcccgcga cactacgggc cgccaggcgga gccaggcgga gtcatctcc gcagggaagc ttcaacatcg cgcctccgcg atggagaggg ttcctcccgg aacacgctcc	2102 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca agattacag agtggctca ageggeggeg teggcaacat agtacggegg cgaatatgc ccategcat ccttetggeg agacgtggct geggeggtt geggeggtt gegegggtt gegegggtt agacgtgtt agacgtatcat ccategcat ccttetggeg agacgtagct gegeggegt agacgtagct gegegeget agacgagt ccategceg agacgagt gegeegeget agacgagt ccategcegegegegegegegegegegegegegegegegegeg</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgtggacctc ccgcgtggcc ccgcgtggc catcgcatc ccgtggcctg catcgcatc ccgagagggc cgcatcgac cgagaggc	cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctga atccggctcg ctgcaggtgc acctacgacc agctgtgcg gacgagtcca gcggtcgcgc ctccaggagt agctgggcgg gactcatcg gacgcggcgaca agctgggcgg	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcga tgatgaagct cggcgctcgt tttttaaact gcgacggcga tcccaagct acccgcagga acagacga acagacga acaggcga tcgtgacga tcgtgacga tcgtgacga tcgtgacga tcgtgacga tcgtgacga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgtg catcaacgtg cgacgagcac catcaacgtg cgacctgcag gatgtttgcg	caaaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcacgc cgtcccgcga cactacgggc cgcaggcgga gtcatctcc gcaggaagc ttcaacatcg atggagaggg ttcctcccgg aacacgctcc gggacggaga	2102 60 120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020 1080
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca agattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cgaatatgc ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcgcgcgtt aggacgagtt gagacgtcat ccgcgcgcg tcggcgagtc gcgccgcgtt aggacgagtc gcgccgcgtt aggacgagtc gcgccgcgt aggacgtcat ccgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgc</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtggccc cgcgtggacctc cgcgcgtggt catcgccatc ccgcgcgctggt catcgcatc ccgacgacgc cgacgacgc cgacgacgc gagaagggc tgacaacatc gqcgatcga	cacgcgatcg gagtatcaat agctggctgt gaccagctga atccggctcg ctgcaggtgc acctacgacc agctgtgcg gacgagtccg gacgagtccg gacgagtcca gcggtcgcgc ctccaggagt agctgtgcg gactcatca gagtcgcg	aacaccccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagca acccgcaggg acaagatcat tggtggacga tcggcgtgga tcatggacgt cggaggtgatgat	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgtg caccaagaac cttcggcgcc catcacgcgc cgacgacgac cgacgagcac cgacgagcac cgacgagcac cgacgagcac	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgccgcga cactacgggc cgccggccgg gccaggcgga gtcatctcc gcaggaagc ttcaacatcg cgcctccgcg atggagagg ttcctcccgg aacacgctcc gggacggaga	2102 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggcgcg tcggcaacat agtacggcggc tcggcaacat ccttctggcg agacgtggct gcgagatatgc catcgccat ccttctggcg agacgtggct gcgcgggtt agacgtggtt gcgcgcgtt aggacgtcat ccgcgcgcgt cggcgcgct cggcgcgtt aggacgtcat ccgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgc</pre>	acctaaaacc ttcctggttt agaaccactg gcgggggaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgegc cgcgtggcc cgcgtggcc cgcgcgcgcgc cgcgctggt catcgccatc ccggggctg catcgcatc cgacgacgcc gaagaagggc ggcaacactc ggcgatcgag cgcatcac	cacgcgatcg gagtatcaat agctggctgt gaccagctga atccggctcg ctgcaggtgc acctacgacc agctgtgcg gacgagtccg gacgagtccg gacgagtccg gcggtcgcgcg ctccaggagt agctggagcg gagtcatca gcgccgcg	aacacccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct acccgcagga acagatcat tggtggacga acggcgtgga tcatggacgt ggacggtgga tcatggacgt ggacggctcga tcggagatgat tggggctcga	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgac catcaacgga cgacgacgac catcacagagac catcacagagac catcacagagac catgctcgcg gacgatgac gacctgcag gatgtttggc gcacagccc cccggaacgtg	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgccgcga cactacgggc cgccggccgg gccaggcgga gtcatctcc gcaggaagc ttcaacatcg cgcctccgcg atggagagg ttccccgg gagagagga gtcatctcc	2102 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agtggcggcgtcggcaacat agtacggcgg ccatcgccat ccttctggcg agacgtggct gcggcagtt gcggcgagtt gcggcggtt agacgtgtt agacgttcat ccgcgcgcg ccaagaatcc agacgaagcc gcaagaatcc agacgaagcc gcctcacccg cctcqcaa acctcqcaa acctcqacaa</pre>	acctaaaacc ttcctggttt agaaccactg ggggggaacg ccttctccac ccgggaggtg cgttacctc ccagatgcgc cgcgtggccc cgcgtggccc cgcgctggt catcgccatc ccgtggcgc cgcctgac cgacgacgcc gaagaaggcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc	cacgcgatcg gagtatcaat agctggctgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca gcgtcgccg gcgagctca gcggtcgccg ctccaggagt agctggcg gactcaca gcgccgcg gacgcgcg	aacacccta cgatggtggg tcatcgctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct acccgcaggg acaagatcat tggtggacga acggcgtgga tcatggacgt tcggagatgat tggggctcga tcggagatgat tggggctcga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgga catcaacgga catcaacgg cgacgacga catcaacgg cgacgacga catcaacgg catcaacga catcaacga catgctcgcg cgacgtccc catcaacgt cgacgacgac	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc gcagggaagc ttcaacatcg cgcctccgcg atggagaggg ttcctcccgcg aacacgctcc gggacggaga ggcgacctcc ggcaggagtcgg	2102 60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agtggcggcgtcggcaacat agtacggcgg ccatcgccat ccttctggcg agacgtggct gcggcagtt gcggcgagtt gcggcggtt agacgtgtt agacgttcat ccgcgcgcg ccaagaatcc agacgaagcc gcaagaatcc agacgaagcc gcctcacccg cctcqcaa acctcqcaa acctcqacaa</pre>	acctaaaacc ttcctggttt agaaccactg ggggggaacg ccttctccac ccgggaggtg cgttacctc ccagatgcgc cgcgtggccc cgcgtggccc cgcgctggt catcgccatc ccgtggcgc cgcctgac cgacgacgcc gaagaaggcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc gacgacgcc	cacgcgatcg gagtatcaat agctggctgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca gcgtcgccg gcgagctca gcggtcgccg ctccaggagt agctggcg gactcaca gcgccgcg gacgcgcg	aacacccta cgatggtggg tcatcgctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct acccgcaggg acaagatcat tggtggacga acggcgtgga tcatggacgt tcggagatgat tggggctcga tcggagatgat tggggctcga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgga catcaacgga catcaacgg cgacgacga catcaacgg cgacgacga catcaacgg catcaacga catcaacga catgctcgcg cgacgtccc catcaacgt cgacgacgac	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc gcagggaagc ttcaacatcg cgcctccgcg atggagaggg ttcctcccgcg aacacgctcc gggacggaga ggcgacctcc ggcaggagtcgg	2102 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggcgcatca agtggcgcg tcggcaacat agtacggcgg ccatcgccat ccttctggcg agacgtggct gcggcgagtc gcggcggtt agacgtgct gcgcgcgtt agacgtgct ccatcgccgc gcgcgcgtt agacgtcat cctcgcgcgcgcgcgcgccaagaatcc agacgaagcc ccatcaccgcctcgcgcgcgcgcgcgccccaccccccccc</pre>	acctaaaacc ttcctggttt agaaccactg ggagggaac gtcgatgatg ccttctccac ccgggaggtg cgcttacctc ccagatgcgc cgcgtggccc cgcgtggccc cgcgcgctggt catcgcatc ccggagaggtg catcgcatc ccggagaggtg cgctcacc gacgacgcc gaagaagggc tgacaacatc ggcgatcgac gcgctcccttc gctccctcac	cacgcgatcg gagtatcaat agctggctgt gaccagctga atccggctcg ctgcaggtgc acctacgacc aagctgtgcg gacgagtcca gcggtcgccg ctccaggagt agctgcgcg gactgcgcg gactgcgcg gacgactca gcgcgcgcg gacgcgcgcg gacgcgcg	aacacccta cgatggtggg tcatcgctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tctccaagct acccgcagga acagatcat tggtggacga tcatggacgt tcggagatgat tcggagatgat tggggctcga tcatcaagga aggactgcat	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg caccaagaat cggcgacgga catcaacgga catcaacga catcaacgg cgacgacga catcaacgg cgacgacga catcaacgg cgacctgcg gacgttcgcg gacgttcgcg gacgtcccgg	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgccggccgg gccaggcgga gtcatcttcc gcagggaagc ttcaacacgc atggcagaggg ttcetccgcg acacgctcc gggacggaga gcctcc gggacggaga cgcgactcc gacgagtcgg ctgcacccgc	60 120 180 240 300 360 420 480 540 600 660 720 780 900 960 1020 1080 1140 1200 1260 1320
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggcgcaca agcggcgcgcg tcggcaacat agtacggcgg ccatcgccat ccttctggcg agacgtagct gcggcgagtc gcggcgagtc gcgcgcgtt agacgttcat ccgcgcgcgc ccatcaccc gcaagaatcc agacgaagcc ccatcaccc ccggtggcgc ccatcaccc ccgqqgttc ccqqqqttc</pre>	acctaaaacc ttcctggttt agaaccactg gcgggggaatg ccttctcac ccgggaggtg cgcttacctc ccagatgcgc cgtggacctc cgcgcgtggc cgtggacctc cgacgacgcc gaagaaggc tgacaacac ggcgatcgac gacgacgcc cgacgacgcc cgacgacgcc cgacgacgcc cgacgacgcc cgacgacgcc cgacgacgcc cgacgacgcc cgcgatcgac	cacgcgatcg gagtatcaat agctggctgt gtggcgcgtg gaccagctga atccggctcg ctgcaggtgc acctacgacc agctgtgcg gacgagtcca gcggtcgcg ctccaggagt agctggcgc gagtccaca gcgcgcgcg aaggccgaca tgggcgatca tgggcgatca	aacacccta cgatggtggg tcatcgcctc tteccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt ttttaaact gcgacggcga tctccaagct acccgcaggg acaagatcat tggtggacga tcggagatgat tggggctcga tcggagatgat tggggctcga acagactcat cggagatgat acggcgtcgga tcatggacgt cggagatgat tagggctcga acggcgtcgat	gaaaaaaaa cttcgctaag cgtggttttc cccgaagccg cctggcggcg tgcctttgcc cttctcgaac ggcgttcgcg ctcagccgtg caccaagaat cggcgacgac catcaacgtg cgacgacac catgctcgcg gacgttcgcg gacgtcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgcgc	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgcaggcgga gtcatcttcc gcagggaagc ttcaacatcg cgcctccgcg atggacgag acacacgctcc ggacggacga cactacggg	60 120 180 240 300 360 420 480 540 600 660 720 780 900 960 1020 1080 1140 1200 1320 1380
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cgaatatgc ccatcgcat ccttctggcg agacgtggct gcggcggtt agacgtgct agacgagtt agacgagtt agacgagtt ccgcgcgcgt cggcgcgtt agacgagtc ccatcaccg ccatcacccg ccatcacccg ccacccggcgcgcgcgcgcgcgcgcgcgcgcgc</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cctgatgatg cgttacctc ccagatgcgc cgtggcctc cgcgtggcact catcgccatc cggcgctggt catcgccatc cgacgacgcc gaagaagggc tgacaacatc ggcgtccctcgac cgcgtgtcatc	cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctcg ctgcaggtgc acctacgacc agcgatccg gcggagctca gcggtcgcg ctccaggagt agctgcgcg ctccaggagt agctgcgcg gagtcatca gcgccgaca tgggcgagctca gcgccgcgcg aaggccatca tgggcgatcg	aacacccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tcccaagct acccgcaggg acaagatcat tggtggacga tcatggacgt cggagatgat tggggctcga tcatcaagga acagcatcga tcggagatgat tggggctcga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac gcgttcagcggt caccaagaat cggcgacgga catcagcgc catcaacgtg cgacgtgcgc catcaacgtg cgacgtgcgc catcaacgtg cgacctgcag gatgtttggc gcacagccc ccggaacgtg gacgctccgg	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtccggga gccaggcgg gccaggcgga gtcatctcc gcagggaagc ttcaacatcg cgcctccgcg atggagagg ttcctcccg aggagaga gtcatctcc	2102 60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440
<pre><210> 45 <211> 2051 <212> DNA <213> Fest <400> 45 gagagcatca aagattacag agtggctcca agcggcggcg tcggcaacat agtacggcgg cgaatatgc ccatcgcat ccttctggcg agacgtggct gcggcggtt agacgtgct agacgagtt agacgagtt agacgagtt ccgcgcgcgt cggcgcgtt agacgagtc ccatcaccg ccatcacccg ccatcacccg ccacccggcgcgcgcgcgcgcgcgcgcgcgcgc</pre>	acctaaaacc ttcctggttt agaaccactg gcggggcaac gtcgatgatg ccttctccac ccgggaggtg cctgatgatg cgttacctc ccagatgcgc cgtggcctc cgcgtggcact catcgccatc cggcgctggt catcgccatc cgacgacgcc gaagaagggc tgacaacatc ggcgtccctcgac cgcgtgtcatc	cacgcgatcg gagtatcaat agctggctgt gtggcgccgt gaccagctcg ctgcaggtgc acctacgacc agcgatccg gcggagctca gcggtcgcg ctccaggagt agctgcgcg ctccaggagt agctgcgcg gagtcatca gcgccgaca tgggcgagctca gcgccgcgcg aaggccatca tgggcgatcg	aacacccta cgatggtggg tcatcgcctc ttcccccggg cccaccgtgg ggaagctcca aggacggcgc gagccgacat tgatgaagct cggcgctcgt tttttaaact gcgacggcga tcccaagct acccgcaggg acaagatcat tggtggacga tcatggacgt cggagatgat tggggctcga tcatcaagga acagcatcga tcggagatgat tggggctcga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga tcatcaagga	gaaaaaaaaa cttcgctaag cgtggttttc cccgaagccg tgcctttgcc cttctcgaac gcgttcagcggt caccaagaat cggcgacgga catcagcgc catcaacgtg cgacgtgcgc catcaacgtg cgacgtgcgc catcaacgtg cgacctgcag gatgtttggc gcacagccc ccggaacgtg gacgctccgg	caaaacaaa atcgccatgg gtggttctgc ctgccgatcg ctcgcgaagg gtgtcgacgc cgtcccgcga cactacgggc cgcaggcgga gtcatcttcc gcagggaagc ttcaacatcg cgcctccgcg atggacgag acacacgctcc ggacggacga cactacggg	60 120 180 240 300 360 420 480 540 600 660 720 780 900 960 1020 1080 1140 1200 1320 1380

	ctggcatggc	gctcggcctg	tacgcactgg	agctcgccgt	ggcgcagctc	gcgcacgggt	1560 1620
	tcagctggga	gctgcccgac	gggatgaagc	taragetara	ggacargage	ctcccatcca	1680
	gcctcaccgc	gccgcgcgcc	accaggetet	tegeegrace	cacyccccgc	acacacacac	1740
	cccagctgct	gggggctgac	gacgccgggc	greaggegre	acgregregr	atazaaatat	1800
	ggccattgtt	gtgttagcaa	gcgatcgatg	gtatatgtac	cagciggaag	ttttatata	1860
	ttgatatatt	cagaggtgat	ggcggcggcg	ccarraging	agerrage	nanananan	1920
	ctttttttac	aactgttgtt	ttactttgaa	ctcaattaag	tetggteaca	acagaacaca	1980
	ataagcggat	tatcatgctc	gctggatgca	tgcttaggat	acagttaage	acggcgcgcc	2040
			tgtataaaaa	gtttttagac	etgetgeace	gcaaartgta	2051
	taaaaaaaaa	a					2031
	10105 46						
	<210> 46 <211> 2461						
	<211> 2461 <212> DNA						
		m noronno					
	<213> Loliu	m bereine					
	<400> 46						
		aacgatcaac	actgtcagaa	tccagataca	cacacacaca	cacacacacc	60
	aagcagcatc	tagctagctt	acttgctcta	gtagttcttt	gcaaatatcc	atggagtccg	120
	agaacgttgc	caccaacaac	gatggcctgt	gcgtggcaca	gccggctcgc	gccgaccctc	180
	tgaactggg	aaaagcagcc	gaggagctgt	ctgggagcca	tcttgatgcc	gtgaagcgaa	240
	taataaaaaa	ataccaccac	cctgtggtga	ccatggaagg	cgccagcctg	actatcgcca	300
-	taatcactac	aataactacc	ggcgccgaca	ccagggtgga	gctcgacgag	teegeeegeg	360
	gacgcgtcaa	ggagagcagc	gactgggtca	tgaacagcat	ggccaacggc	accgacagct	420
	acogtotcac	caccaacttc	ggtgccacct	cccaccggag	gaccaaggag	ggtggcgctc	480
	tccagagaga	gctcatcagg	tttctcaatg	cgggagcatt	cggcaccggc	agcgatggcc	540
	acqttctqcc	cgctgcgacg	acgagggctg	ccatgcttgt	ccgtgtcaac	accctgctcc	600
	agggctactc	tggtatccgc	tttgagatcc	tcgagacggt	cgccacgctt	ctcaacgcca	660
	acqtqacacc	gtgcctaccg	ctccggggca	cgatcacggc	atccggtgac	ctcgttccgc	720
	totcctacat	cacaaacctt	gtgaccggcc	gcccaaattc	tgtggcgact	gctccggatg	780
	gcacgaaggt	taacgctgca	gaggcattca	aaatcgcggg	catccagcac	ggtttctttg	840
	agctgcagcc	taaggaaggc	cttgccatgg	tcaacggcac	cgcggtgggc	tccggactgg	900
	catccatagt	gctcttcgag	gctaacatcc	ttggcatcct	cgctgaggtt	ctgtcggctg	960
	tattctataa	ggtcatgaac	ggcaagccag	agtacaccga	ccacctcacg	cacaagttga	1020
	agcaccaccc	tggtcagatt	gaggccgcgg	ctatcatgga	gcacatcctt	gaaggaagct	1080
	cctacatgat	gctcgcgaag	aagctcggcg	agctcgaccc	actgatgaag	ccgaagcaag	1140
	ataggtatgc	ccttcgaaca	tcaccgcaat	ggctgggccc	tcagattgag	gttatccgtg	1200
	ccgccaccaa	gtccatcgag	cgcgagatca	actccgtcaa	cgacaacccg	ctcatcgacg	1260
	tctctcgagg	caaggccatc	catggtggca	acttccaggg	cacacccatc	ggtgtgtcca	1320
	tggataacac	caggcttgcc	attgctgcga	tcggcaagct	catgtttgcc	cagttctctg	1380
	agctagtgaa	cgacttctac	aacaatggtt	tgccttccaa	tctctcgggt	gggcgcaacc	1440
	cgagcttgga	ctatggcttc	aagggtgctg	agattgccat	ggcctcctat	tgctccgagc	1500 1560
	tccaattctt	gggcaaccct	gtgactaacc	atgtgcagag	tgcggagcag	cacaaccaag	1620
	acgtcaactc	tcttggtctc	atctctgcta	ggaagacctc	tgaggccatc	gatattetga	1680
	agctcatgtc	atcgacattc	ttggttgcac	tgtgccaagc	tategacete	aggedaceteg	1740
	aggagaatgt	caagaatgcc	gtcaagaact	grgrgaagar	ggtggctagg	adyaccctya	1800
	gcaccaatga	cagtggccat	ctccacagcg	cacgettetg	ttaaaaaaat	aactacccac	1860
	cgatcgaccg	cgaggcggtg	ttegeetaeg	cagacgaccc	ragasagget	aactacccac	1920
	tgatgcagaa	gatgcgtgca	t+accesses	ageaegeett	ggccaacggc	gaggctgagc ctccgtgcag	1980
	gggatgtgca	gacgtcagtg	tangagagat	gtgccgcatt	gagcaggag	gccgcgcagc	2040
	tgcttccaag	ggaggtcgag	cageeegge	gratataga	cttcatacac	aaggagctcg	2100
	aaaaccgcat	cattonaga	dadaadacca	artetectar	taaaaaaata	gacaaggtgt	2160
	ttataaatat	anagadaga	gagaagacga aaacacatca	acacactact	taaatacctc	aaggagtgga	2220
	accetance	cctccctatc	tactasaass	tgaatcaagg	aactgaagaa	tagagtactt	2280
	dadad+cac	aaggeteee	atgtgcttag	ttaatadtaa	gtatagtact	gttttttcat	2340
	totatottot	gcattatata	tacatotaac	actggaataa	aatttcaaaa	aatcagatca	2400
	ctcaatggg	agcatgtaac	actggaataa	aaatttcaaa	aaaatcagat	caaaaaaaaa	2460
	a						2461
	<210> 47						

<210> 47

<211> 2596 <212> DNA

<213> Festuca arundinacea

```
<400> 47
gctcctctgt aattcgagct cctcttcagc acaagtactt ccaccagagt gccagacaac
                                                                        60
                                                                      120
aatccagcac cacttccaga atacatacac acacgtaccc gtgtctaaac cttacttgct
ttcctagttc tttgcatatc tccatggagt gcgagaacgg gcacgttgcc gccaacggcg
                                                                      180
atggcctctg cgtggcgcag ccagcccggg ccgaccctct caactggggg aaggcagcag
                                                                      240
aggagctgtc cgggagccat ttggatgccg tgaagcggat ggtcgaagag taccgcagac
                                                                       300
cagtcgtgac catggagggc gccagcttga ccattgctat ggtcgccgcg gtggccgccg
                                                                       360
                                                                       420
gcgccgacac ccgggtggag ctcgacgagt ccgcccgcgg acgcgtcaag gagagcagcg
                                                                       480
actgggtcat gaacagcatg gcgaacggta ccgacagcta tggtgtcacc accggcttcg
gcgccacctc acaccggagg accaaggagg gtggcgctct gcagagagag ctcatcaggt
                                                                       540
                                                                       600
tccttaacgc gggagcattt ggcaccggca gcgatggcca tgttttgccc gctgcaacaa
ccagggcggc catgctcgtc cgtgtcaaca ctctgctcca ggggtactct ggcatccgct
                                                                       660
togaaattot ogagacgato gocacgotto toaatgocaa ogtgacgoog tgoctacogt
                                                                       720
                                                                       780
accggggcac aatcacggca tccggcgacc tcgtcccatt atcctacatc gccggccttg
tgactggccg cccaaactct gtggcgacag ctccagatgg cagcaaggtt aacgcagcag
                                                                       840
                                                                       900
aggettteaa gattgeegge atceageatg gettetttga getgeageee aaggaaggee
ttgccatggt caacggcact gccgtgggct ccgggctcgc gtccatagtg cttttcgaag
                                                                       960
ctaacatect tggcatectt geogaggtte tateggeegt gttetgegag gtgatgaatg
                                                                      1020
                                                                      1080
qcaaqccqqa qtacaccqac cacctaacac acaagctgaa gcaccacccg ggccagatcg
aggccgcggc catcatggag cacatccttg aaggcagctc ctacatgatg ctcgcgaaga
                                                                      1140
agctcggtga gctcgaccca ctgatgaagc caaaacaaga taggtatgca ctccgcacat
                                                                      1200
caccacaatg gctcggccct cagatcgagg tcatccgtgc tgctaccaag tccatcgagc
                                                                      1260
gtgagatcaa ctccgtcaac gacaacccac tcatcgacgt ctcccgcggc aaggctatcc
                                                                      1320
                                                                      1380
acqqtqqcaa cttccagggc acgcccatcg gtgtgtccat ggacaacacc aggcttgcca
ttgcggccat cggcaagctc atgtttgccc agttctcgga gcttgtgaac gatttctaca
                                                                      1440
                                                                      1500
acaacggttt gccttccaat ctctctggtg ggcgcaatcc gagcttggac tatggcttca
                                                                      1560
agggtgctga gattgctatg gcctcatact gctccgagct ccagttcttg ggcaaccctg
tgactaacca tgtgcagagc gccgagcagc acaatcaaga cgtcaactct ctcggcctca
                                                                      1620
                                                                      1680
tctcttccag gaagaccgct gaggcgattg acattttgaa gctcatgtcc tcgacattca
tggttgcctt gtgccaagct atcgacctcc gccacatcga ggagaatgtc aagaatgccg
                                                                      1740
tcaagaactg tgtgaagacg gtggctagga agaccctgag caccaatgac agtgggcatc
                                                                      1800
                                                                      1860
tccacaatgc acgcttctgc gagaaggacc tgctcctgac gatcgaccgt gaggcggtgt
tcgcctacgc agatgaccct tgcagcgcca actacccgct gatgcagaag atgcgtgcgg
                                                                      1920
                                                                      1980
ttctcgtgga gcatgccttg gccaacggtg aagccgagca ggacgtgcag acgtcagtgt
                                                                      2040
tcgccaagct tgccacattc gagcaagagc tccgtgcggt tcttcccaag gaggtcgagt
ctgcccggtg ttccgtggag aacggcaccg ccgcacagca gaaccgcatc agcgaatgcc
                                                                      2100
gqtcataccc gctctatcgc ttcgtgcgca aggagctcgg gactgagtat ttgaccggag
                                                                      2160
agaagacgag gtctcctggt gaagaggtgg acaaggtgtt tgttgctatg aaccagggta
                                                                      2220
agcacattga cgcgctgctt gagtgcctca aggagtggaa cggtgagccc ctgcctatct
                                                                      2280
                                                                      2340
gctgaagaat ggctcaagga actcaagaat agagtgcttg agaattcaga tggtactgtt
ttataattat atctccggat atcgatgttt gcaatgttcc tccagagctg caatgccagt
                                                                      2400
tagaaaagat aatagcatga cttggtagtg ttgtttagcc tagaaatttt ctatgatgtt
                                                                      2460
agttagtaaa agggtacact ttgtgataaa tatacataat tattgcacta gtcctttatt
                                                                      2520
tttatatcaa tgttctgtct actgaggcaa ctttgaagga ttcaaagaat ctagtattgg
                                                                      2580
                                                                      2596
cctqccaaaa aaaaaa
<210> 48
<211> 1301
<212> DNA
<213> Festuca arundinacea
<400> 48
ggtcccttgt atcagctgat catggctttt tccggcagcg tcagcggcgt tgttctcgtc
                                                                        60
gtggcgatcc tgcttctggg tctggccgcg gcggcgtcgg cacagctgtc ggcgacgttc
                                                                       120
                                                                       180
tacgacgcgt cctgcccgag cgcgctcgcg acgatcaaga gcgccgtgac ggcggcggtg
aacaacgagg cccgcatggg agcctccctg ctcaggctcc acttccacga ctgtttcgtc
                                                                       240
caaggatgcg acgcgtcggt gctcctcaac gacaccgcca acttcaccgg cgagcagacg
                                                                       300
gccttcccca accgcaactc catcagggga ctcaacgtca tcgacaacgt caaggcgcag
                                                                       360
gtcgaggccg tatgcacgca gaccgtctcc tgcgccgaca tcctcgccgt cgccgcccgc
                                                                       420
qactccatcq tegecetagg agggeegteg tacaeggtte egetggggag gagggaetee
                                                                       480
accaccgcga gcctgtccga ggcgaacagg gacctcccgc cgccgtcctc cgacctcgcc
                                                                       540
gatetegteg geaacttete caggaaagge etcagegtea cegacatggt tgegetetea
                                                                       600
ggagcccaca cgatcgggcg ggcggcatgc ttaaacttcc ggagccggat ctacggcgag
                                                                       660
tccaacatcg ccccggcgta cgcggcgtcg ctgcaggcca actgcccgca gtccgccccc
                                                                       720
aatggcgacg gtacactcgc accgctcgac gtgtccaccc ccgacgcctt cgacaacgcc
                                                                       780
tactacggca acctgctctc gcagcagggg ctcctccact cggaccagca gctcttcaac
                                                                       840
```

ggcggctcga ccgactccct gacttcgccg cggccatggt gagatccggc tcaattgtgg gtgaaagtgg atggggcaca ataaggtgtc aacgtgaagg acagggattc agattcagtc aaggatataa taatactgta ctatcaacaa ccacattct	gaacatgggc caaggtgaat tgcaattgcg ccatattgat atttctcctt taatcctgta	aacatcggcg tgagtgaaag aagctgggct gtgcttattg cgcatggtct aaaaaaggaa	tgctcaccgg cccgacaact ggtagcttta ggcctatctt atttgtttcc acgatactgt	cgcccagggg gagactgcag ctgaaaccga ggaattcctt cacagaaaat	900 960 1020 1080 1140 1200 1260 1301			
<210> 49 <211> 1236 <212> DNA <213> Lolium perenne								
<pre><400> 49 gagatggctt gtcctggcgg gagctgtgcg gagctgtgcg gagctgagtg gtgctggtgg gtccacaa ttccacgact ttccagtccg gacgccgca ctggggggc ctggggggc ctggggggc ctggggggc ctggggggc ctggggggc ctggggggc ctggggggc ctggggggc ctggaggcc ctggggggc cgtctgtaca acttcagcgg gcgttctgt ccgacgacgc ctgacgacgc ctgacgacgc ctgacgacgc ctgacgacgc ctgacgacgc ctgacgacgc ctgacgacgc ctgacacctt ttcttgact ctgacgacac attgtcgata gcgttctgt tcaattgatg tagctatat gcgcaaaatc gcaaccaat gtacgtagg </pre> <pre><210> 50 </pre> <pre><211> 1205 </pre>	cctcctccac cgaccacacg gtcggacccg gggctgcgac gcgccccaac cgagaaggcg ctccgtccag gacctccagc cacccttaag tcacacttc gacgaaccag cccaaggaac tgacaagaac actcaaatca cagccaggac gccaattaca ttaattagca atggatctca ttatgtgcat	ggcggaggcg tgtccggacg cgcatcttcg ggctcgctgc aacaactcgg tgccccggag ctgtccggag atagccggcg ttccaagccg ggtcgcgtga cctgacccga ggcgatgcaa tacttcacga gacccaggtg gcattcttta gatccctcc agaaggccac ttgtcatgtt gctttgatcc	ggagtagcgc cgtacaagat ccagcctcat tgctggacac cgcgcggcta tcgtctcctg gacccgggtg cccagaacct tcaatctcga aatgccggtt ccctacatgc actctctaaa acctcgagaa cattaacgac agagcttcgc gtggagaagt atgtggatac caataatgg	atcggcggcg cgtgcagggg cgtgcagggg ccgcctccat cttccccggc ccccgtcgtc cgccgacatc ggcgtgttg acccggcccg cgttactgac cgtcacgaac ggcttaccgg tgaccttgat aaatcgcgc gacggcgcg atggtctatg ccggaaacac aactacggcc taatatat	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1236			
<213> Festuca arundinacea								
<pre><400> 50 gcaagcttcc gaagcaaagc tatttggctt tcgcggcggt cgtgcccaag caagcctcgc acggctcggt tcttgtggac agacgctggt cgtgcaacggt caggctcggt cgaaaggccc acggctcgac caagaccga caagaaccga cacgaaccga catcgcaagaa catcgcactg gcaacagaa catcgcactg catcgcactg catcgcaccg catcacctt gtctcgacg agtctcgac caacagcac catcgactga caacagcacg tcgactactt tcaccgacga agtcttcgc gaagccaggg taccggttgc caacacctt gcacaaccg agtctcgac caacacctt caacaccgac caacacctt caacaccgac agtctctcgc gaagccaggg taccggttgg cataccaacc tactgtaaaa ccgttactt aaaaa</pre>	ctaacaatgg tgcgctcatg gtcgtccgga ctcaggatgc tcggcgaaca ttcgtcgaga gacgtggtca gttcctttgg cctccaccg aaggacctcg tccgaccggc gaaccttct ctcgtggaaa agcaagcgga gcctacatcc gtctccatgg aagaagtgct cttttgattt	cgacgagggg cacagctgca aggagatggt acttccacga agacggcgga gggtgaaggc cgctcatagc gccggcgaga ccaacatcac tcgtcctct tctacaactt acatggcaaaa tggaccccgg ggggcctctt tgcgccacgc tagagatggg ccgtggtgaa gtgaccatgt	tgtcatggtg cgagaagttc catggcgcta ctgcttcgtc gaaggacgcg cgccgtggag cagggacgct cggcagcgtg cgtgctcacc tgccgcac cacgggcctc gctgaagag caactccgac caccggcgcc caacaccgac ccattagtta ttttttctg	gcgctgctgc tacagtgagt tccctcgcgc aggggtgcg ctgcccaacc aaggcctgcc gtctggctga tccatctcca cagctcttcg acgatcgga gacaacgcca aagtgcacca accttcgacc gtgcctcc ttcaaggacg gtgctcactg gcgtggaag tgtagattat	60 120 180 240 300 360 480 540 600 720 780 840 900 960 1020 1140 1200 1205			

```
<210> 51
<211> 1382
<212> DNA
<213> Lolium perenne
<400> 51
ggccacaact cgccacattt ggcatagcga gcactgacag cgagctacat ccatcaccat
                                                                       60
ggettetage egtgteetge teetegtegt ggeagetetg gegateteeg tgteegeeac
                                                                      120
                                                                      180
ggccgcggcc accaagatca gtgctccact accgccgctg gccaagggcc tgaacttcga
tttctacaag gccacctgcc cgcaggccga gtccatcgtc ttcaacttcc tccgcgacgc
                                                                      240
cateegeaag gaegteggee tegeegeege geteeteege ateeaettee acgaetgett
                                                                      300
                                                                      360
cgtgcagggc tgcgacggct ccgtgctcct cgacaagacc ggcggcaccg acagcgagaa
                                                                      420
gategeacea eccaaegtea egeteegeee cacegeette aaggeeatea aegaceteeg
                                                                      480
cqctctcctc gccaaggcct gcggcgccgt cgtctcctgc gccgacatcg ccgccctggc
cgcgcgcgac tccgtgcacc tcgccggcgg gccgcactac cccgtcccgc tcggccgccg
                                                                      540
                                                                      600
cgacgggctc gccccgcga acctcaccac catcctcaac gccctcccgg caccgagctc
caacgtcacc accetectca gattectege caagatcage etegacgeca acgaectegt
                                                                      660
cgcgctatcc ggcgcgcaca cgctcggcat cgcgcactgc acctccttcc aggagcgcct
                                                                      720
                                                                      780
cttcccqcaq aacqacqtca ccctcaacaa gtggttcgcg tcgcagctca ggctcacctg
                                                                      840
cccggcgctc aacaccgaca acaccaccaa caacgacatc cgcaccccca acgtcttcga
caacaagtac tacgtcgacc tgctcaaccg ccagggactc ttcacctccg accaggacct
                                                                      900
gcacaccgac gccaggacca agcccaccgt caccaggttc gccgtcgacc aggccgcctt
                                                                      960
                                                                     1020
tttcgaccag ttcgtcttct ccgtcgtcaa gatgggccag atcaacgtgc tcaccggcag
                                                                     1080
ccagggacag atacgcaacg actgctccgc gcccaacaaa ggccgcacca acgacgacct
                                                                      1140
qccqtqqtcc gtgctcgaga ccgtcaccga ggccgcccag agcttggtgt tgtagatatg
cgctgtggat aggttggttc agtcgatcca tctctagcct acgtactttc ttcccaaagt
                                                                     1200
tgtagcttta ttagcgagcc gtgtggtaat ggtttgggct ttgagagcca cagttgatgc
                                                                     1260
atgtgtgttt agtttcttga gcaactcgac cagtttaata atcacgagat ggtttttggt
                                                                     1320
                                                                     1380
gtgtcgaatg acgactagaa aattgagatg aatatttgat gttattttca ataaaaaaaa
                                                                      1382
<210> 52
<211> 1261
<212> DNA
<213> Lolium perenne
gategeettt etectecatg accaecatgg geggetegte gateetgeee gegeegaeeg
tggcgacgac ggcgctggtt ctgctgatcg tgctgttcgc atcgccggca acggtggcga
                                                                      120
                                                                       180
aaggttctgg gctgtccgtc gggttctaca agaagttgtg tccgaaggcg gagaaggtcg
tccggcgaac tgtcaccaag gcctttgaga aggagcctgg caccccggcc gacatcatcc
                                                                       240
                                                                       300
qcctcttctt tcacgactgc tttgtccgag ggtgcgacgc atcggtgctg ctggaatcca
cgccagggcg catggcggag agggactcga aggcaaacaa ccccagcttg gatgggtttg
aggicattag cgacgccaag gagacccttg agaagctctg cccgcaaacc gtctcctgtg
                                                                       420
                                                                       480
ctgacattct cgccctcgcc gcccgcgatg gcgcctacct cgctagcggg ctcgactatg
cggtgcccac cggccgccgt gatggcctcg tctccaagga agacgaggtt ctccctagtg
                                                                       540
                                                                       600
tcctcaccc cgacttcaac cattctcagc tcgtggaaaa cttcacggca aaaggcttta
cggcggagga gatggtgacg ctgtcggggg cgcacaccat cggcacctcg cactgctcgt
                                                                       660
ccttcacgga ccgcctctac aacttctccc agggcggcgc gctgaccacg gaccctgcgc
                                                                       720
                                                                       780
tgccggcggc atacgccgcg ctgctgaagg agaagtgccc gccggagaca gcggcgcaga
acgacaccac catggtgcag ctcgacgacg tgacgccgtt cgtgatggac aaccagtact
                                                                       840
acaagaacct gcttgccggc accgtgccgc tcggctccga cgtagcgctc atggagagcc
                                                                       900
ccgacacggc ggcgctcgtc gagctctacg cccgcgagcc cgccgagtac tgggccaagc
                                                                       960
gettegttge ggegatggte aaggtgageg agatggaggt geteaceggg geegaggggg
                                                                      1020
                                                                      1080
agatccggct caactgctcc aaggtgaact agtatataac cggttgctgc gtttgtctct
gtactatatg tttgggaaag atgacgatac acgttcttct tttgtgttaa tgttttttct
                                                                      1140
ttcatttgtt ttcatatggt ggtgagaaat atatacacat ttgtttgcgt cataaactgt
                                                                      1200
aaagcttaca cagcatgcat aaaagcatct atatcattcc atttgagttg taaaaaaaaa
                                                                      1260
                                                                      1261
<210> 53
<211> 1059
<212> DNA
<213> Lolium perenne
```

<400> 53 acgagggaga actactacgg gtgacgacgg cggtgctgct cacgactgct ttgtgcaagg acggcgaga agggggccgg aagatcaaga tgctgctgga gccgtcgccg cccgcgactc ggaaggaggg acgccaccac aactccaacc tcaatgatct atggttgctc tatcaggggc cggatctaca ccgacaccga ccacaggccg gcggcacgg gataacggct acttctccgg gtaacgacg gcggctccac tttggcagcg acttcgctgc tcgtccgggg agatcaggggt atcatgaaac ttgtacactgc ctatttattt	ggaccaccgc gtgcgacgcg gccgaacgcc gttcatgtgc cgtcgtccgt agcaagcgcg cctcaccgct ccataccatc cattgacggg cacctctcc ggacgatctg ggcgatggtg caactgccgg tgcgatttcc	atgggcgctt tccgttctgc gggtcgctgc ccgcggaccg ctaggggggc tcacttgcta ttctccaaaa ggccggcgc gcattcgcag ccgctcgacg cgccaggggc gtcaggacct aaactgagca gcggtgaatt ggaactgcag	ctcttctccg tggatgacac gcggtctgga tctcctgcgc catcatgggc gtagtgacct aaggactaag agtgccagaa cgtcctctcc tgctccattc acgcctccaa atatcggcct aacgatggat gcaacgaaac	gctccacttc ggcggcttc ggtgatcgac cgacatcctc ggttcaactt cccaggccc caccacggac ctaccggaac aggcggctgc caacaccttc cgaccaggcg taacgatcag gctgacggg gatggggg tgcatattta	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020
tccatgttaa gatggtggca			ctgttatatt	deacecacaa	1059
<210> 54 <211> 1266 <212> DNA <213> Festuca arundina					
<400> 54					
ggccagataa caagtgcagg cttgtagcta gccatagcca tctggccgcc acggcggcgt cagggccttg gccaccatca gggtgcgtcg ctgctcaggc cgttctgctg tcgggcaacg cggcgtcatc gacaacatca cgccgacatc ctcaccgtcg gacagttcct ctcggcagac gggccctgga tccagcctcg cgtggacatg gtagcgctct ccggtcgcgg atctacggcg ggccaactgc ccgcagtccg caacgccttc gacaacgcct cgaccaggtg ctcttcaaca cggggcggcg tcttcaaca cggggcggcg tcttcaaca cggggcggcg ccaacgcct cgaccaggtg cccacaggcg gtacagggag gtacagggag ccaactgccaacaca acggggcgg ccaactgc caccaggtg ccaacgcct cgaccaggtg ccaacagaca acggcgg acgacagaca atatacgtgc agctcaaaat atgcaaaggc ataaaagaatt aaaaaa	tggcatctgc cggcgcagct agagcggcgt tgcacttcca agcagaacgc agacccagct ccgcccgtga gggactcgac cacagctcca ccggcgcgca gcgactctaa gcggcaacgg actacaccaa acggcagca cgttcgagc gtactacagct ttcgcgac agatcaggct gtcgcagca gtactattag tattcatgca	ctcttgcatt gtcgtcaacg ggcggccgcc cgactgcttt gcccgcgaac cgagggtatc ctctgtcgtc gagcgcaacc ggcgcgttc caccatcggg catcaacgcc caacctgcgc ccgacaacacc ggcgatgatc cagctgctcc cagctgctcc cagctgctcc cagctgctcc cagctgctcc catacgtca cagctgctcc ctatacgtca cagttcagca cctctacaca	tctttggtgt ttctatgaca gtgagcagca gttaatggct gccggttcgc tgcaagcaga gccctcggag ggcaataccg gccaagaaga cgggcgcagt gccttcgcga gcgctggacg cagaaggggc gtcaggaact aagatgggca aaggtgaact cgtgaatgaa ctgtgatgaa ttgtaactatc	tgctggtggc cgtcgtgccc accccgcat gtgacgcgtc tgtttggctt ccgtctcctg gcccgtcatg ggacctccc acctgaacct cctcgaccac ccacgaacct tctccactc tcgctccac tcgctccac tcgctccac acacgaccgc tcctccactc tcgcgtccag acatctcgcc cgtgattagc taaggccaca ccgtgtatat gaattctctc	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1140 1200 1260 1266
<210> 55 <211> 1164 <212> DNA <213> Lolium perenne					
<400> 55 gctagctccc cggcgctacc cgccaagtcg cctggcttgg tcaggctcct cttcctccc ggagacgcgc tcggccgtcc ctccagagcc aagcggcagt tttcattatt caatatacaa ccgccgctgg cccgtcgcc cgagggatgg agctcggcg gccgacgccg ccgtgtccgc gctgcagaca acgccttctt gtgaccatga tcctgccgct	ccggtcggca cctggccctg actgctcgcc ctagcccaac aatggcgtg gggcacagcc caacttcatc gctcgccacg	ctccctcat gaggcagtcg gccgctgcct agcaggagcg tcggagcttg cacgcgcact aagttcacgg agttggccg gtcacaggcg	cccctggctc gtcggatctg tctagccact tagaatagtg aggtcgacgg tcctcgccgg ccatcggcgt ggaaacccgc agttcgagaa	accectece geeggtegee accgtteage ttacetettg egtegtette egeaggtgtg gtacetgeag egaegagett gtteaegeeg	60 120 180 240 300 360 420 480 540 600

gtcgcgtact ttcaaggagg tcccccgccg ggcgtggcga cacggggtct gaggccgccc cggacaccgt cggagtttct aaccgctgcc	ccttcaggac gcgtcctcac tcgagaacag cgccggcggc ccgtcggcca cactgctggc accgttgttt	tgagagcttc cgtcgcgttc gccgctctgc gaagctcagc agcggcggca ttgtgtggtt tctgttgtgt	cctcccggcg tcgaaggact gaggccgtgc ctggcgacca gagcccgtgt ggcgatgtcc	cgtccatcct cgtcggtacc tggagtccat gggtcgccga cggtttctgc gttgttgaga	cttcacccac agagtcgggc catcggcgag gctcctgaat gtgaacggac cgtcgtgttc	720 780 840 900 960 1020 1080 1140 1164
<210> 56 <211> 933 <212> DNA <213> Festu	ca arundina	ncea				
<400> 56 gtgcacacac	agetagget	acaatecace	cctatctcca	accacacaca	catcgatctc	60
ataccatcgg	ccgtctcgga	gcttgaggtc	gacggcgtcg	tcttcccgcc	gctggcccgt	120
ccgccgggca	cagcccacgc	gcacttcctc	gccggcgcag	gtgtgcgagg	gatggagctc	180
ggcggcaact	tcatcaagtt	cacggccatc	ggcgtgtacc	tgcaggccga	cgccgccgtg	240 300
tccgcgctcg ttcttccgcg	ccgcgaagtg	ggccgggaaa	cccgccgacg	agerracege	catgatactg	360
ccqctcaccq	gcgcgcagta	ctccgagaag	gtgaccgaga	actgcgtcgc	ctactggaag	420
gccgtcggca	agtacacgga	cgctgaggcc	gccgccgtcg	acaagttcaa	ggaggccttc	480
aaggccgaga	gtttccctcc	cggcgcgtcc	atcctcttta	cccactcccc	cgccggcgtc	540 600
ctcaccgtcg	cgttctcgaa	agactcgtcg	ttgccggagt tccatcatcg	cgggcggcgt	ggcgatagag	660
gccgcgaagc	tcagcctggc	gaccagggtc	gccgagctcc	tgaaggaggc	cgcacccgtc	720
ggcgagccgg	cggtggcaga	gcccgtgtcg	gtttcagcat	gaacggactg	ggcaccgtca	780
ctgctggctt	atacatgtgg	ttggtgatgt	ccgtgttgag	acatcgtgtt	ccggagcttc	840 900
taccgttgtt attgaaattt			cgtgctaact aaa	tgaataaaga	aaccccagcc	933
<210> 57 <211> 1531 <212> DNA <213> Loliu <400> 57	_					
<211> 1531 <212> DNA <213> Loliu <400> 57 gactcattca	tctgtcgtct	cctgcttccc	tcaagcttag	atcgattgca	gccggccggg	60 120
<211> 1531 <212> DNA <213> Loliu <400> 57 gactcattca gactgtcgag	tctgtcgtct	cggtcgctgg	tacgagcgga	cgtaaggaga	gatccagatg	120
<211> 1531 <212> DNA <213> Loliu <400> 57 gactcattca gactgtcgag gccgcgacga	tctgtcgtct ctaccactgc tgaccgtgga	cggtcgctgg ggaggtgagg	tacgagcgga aaggcacagc	cgtaaggaga gggcggaggg	gatccagatg gccggcgacg	
<211> 1531 <212> DNA <213> Loliu <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc	cgtaaggaga gggcggaggg accaggctga tcaaggagaa	gatccagatg gccggcgacg ctacccggac gttcaagagg	120 180 240 300
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca atgtgcgaca	tetgtegtet ctaccactge tgacegtgga teggeaegge agateaecaa agteteagat	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag	120 180 240 300 360
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgcgcca	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt	120 180 240 300 360 420
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggca tactacttca atgtgcgaca atgtgcgaca atgtgcgaca gagaacccca gtcgtcgagg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tcccgaagct	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgcgcca aggcgatcaa	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc	120 180 240 300 360
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gcgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagcgcgggt ggcgcgggt	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tcccgaagct ccaagatcac acagctcac	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgccca aggcgatcaa cctctggtgt	gatccagaty gccggcgacy ctacccggac gttcaagagy gatcctggay ggacatagtt ggagtggggc ggacatgcca gcgcctcatg	120 180 240 300 360 420 480 540
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gcgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagcacgagg cagcagggt gcgcgact atgtaccagc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tcccgaagct ccaagatcac acagctcac	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgccggcggc	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc	cgtaaggaga gggcggaggg accaggctga tcaaggagga tgacggagga acgcgcgcca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa	gatccagaty gccggcgacy ctacccggac gttcaagagy gatcctggag ggacatagtt ggagtgggc ggacatgcca gcgcctcaty ggacctggct	120 180 240 300 360 420 480 540 600
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccgact atgtaccagc gaaaacaacc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tcccgaagct ccaagatcac acagctcac agggctgctt gcggcgcgcg	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgccggcggc	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc gtctgctcgg	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgccca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc	gatccagaty gccggcgacy ctacccggac gttcaagagy gatcctggag ggacatagtt ggagtgggc ggacatgcca gcgcctcaty ggacctggct cgtgaccttc	120 180 240 300 360 420 480 540 600 660 720
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccgcgt ggcgccgact atgtaccagc gaaaacaacc cgcggcccgc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcacaa agtctcagat acatgtgcgc tccagaagct ccaagatcac accagctcac agggctgctt gcggcgcgg acgagtcaca	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc gtctgctcg	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgcgcca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc ggacatgcca gggcctcatg ggacctggct cgtgaccttc cggggacggc	120 180 240 300 360 420 480 540 600
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccgact atgtaccagc gcagccgcgcgcgcgcgcgcgcgcgcgcgcgcg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcacaa agtctcagat acatgtgcgc tccagaagct ccaagatcac accagctcac agggctgctt gcggcgcgcg acgagtcaca tgataatcgg	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc cagcggcgc cgtgctggtg cctcgactcg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc gtctgctcg ctggtcgcc gacgtgtccc	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgcgcca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggacggc gctgttccag	120 180 240 300 360 420 480 540 660 720 780 840 900
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccact atgtaccagc gcaccagcgact atgtaccagc gcgcgccgcg gcgcgcgcgcgcgcgcgcgcgc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcacaa agtctcagat acatgtgcgc tcccgaagct ccaagatcac accagctcac agggctgctt gcggcgcga acgagtcaca tgataatcgg cgagccagac gcctcacctt	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctgccg ccacctcctc	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacca acggtgctcca gtctgctcg gtctgctcg gtcgtcgcc gacgtgtccg gacgtgtccg gacgtgtccg aaggacgtgc	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgcgca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgcaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga ccgggctcat	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggacggc gctgttccag cggccacctc ctccaagaac	120 180 240 300 360 420 480 540 600 720 780 840 900 960
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccact atgtaccagc gcacacc gcgcgccgc gctgcgcgc gctgcgcgc gctgcgcgc atggtgtcgg agggaggtcg atcgagcgcg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcacaa agtctcagat acatgtgcgc tcccgaagct ccaagatcac accagctcac agggctgctt gcggcgcga acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggeg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctgccg ccacctcctc agccttcaag	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacca acggtgctcc gtctgctcg ctggtcgcc gacgtgtccg gacgtgtccg gactcggagg aaggacgtgc ccgctcggca	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccca aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga ccgggctcat tcgacgactg	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtgggg ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggacggc gctgttccag cggcacctc ctccaagaac gaactcgtc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gtcgtcgagg cagccgcggt ggcgccgact atgtaccagc gaaaacaacc cgcggcccgc gctgccgcg gctgcgcgg taggaggtcg aggaggtcg atggaggtcg atcgagggcgcgcg tttgggtgg ttttgggtgg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccaagatcac accagctcac agggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgcacccggg	cggtcgctgg ggaggtgagg gacgcccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctcccc cacctcctc	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc gtctgctcgg ctggtcgcc gacgtgtccg acgtgtccg acgtgtccg acgtgtcca acgctggagg aaggacgtgc ccgctcggca atcctcgaca	cgtaaggaga gggcggaggg accaggctga tcaaggagaa tgacggagga acgcgccca aggcgatcaa cctctggtga gcctcgccaa agatcacggc aggcgctctt tcgagcgccatcga ccgggctcat tcgacgactg tggtgaagg	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc ggacatgcca gcgcctcatg ggaccttc cgtggaccgtc gctgttccag cggccacctc ctccaagaac gaactccgtc aaaggtaaac	120 180 240 300 360 420 480 540 600 720 780 940 960 1020 1080
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gtgctgcgacg gcgcgcggt ggcgccgact atgtaccag gagaaccca gacgcgggt ggcgccgact atgtaccagc gaaaacaacc cgcggccgg ctggtgtcgg agggaggtcg atgaggtcg atgaggtgg agggaggtcg atcaacaagg agcgcatqc gctcaacaagg agcgcatqc agcgcatqc gagcatqc gcgcatqc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccagagct ccaagatcac accagctcac agggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga gcgcacceggga gagcggatgcg tcctcttcat	cggtcgctgg ggaggtgagg gacgcccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg ccacctcctc agcctcctc agccttcaag tgcaccagg cgtgcagcg cgtgcagcg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgcgcc acggtgctcc gtctgctcgg ctggtcgcc gactgctgcg aaggacgtgc ccgctcggca atcctcgaca cacgtcctct atgcgcaagc	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga tcgacgactgt tggtgaggc ccgagtacgg gctcttccgaggccc	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtggggc ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggacggc gctgttccag cggccacctc ctccaagaac gaactcgtc aaaggtaaac caacatgtcc ggatggtcac	120 180 240 300 360 420 480 540 600 660 720 780 900 900 960 1020 1140 1200
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gtgctgcgacg gcgcgcggt ggcgccgcg cagcccca gcgccgcggt ggcgccgcg ctgttcgag ctgttcgag ctgttcgg gctgcgcgc gctgcgcgc gctgcgcgcg ttttgggtgg ctcaacaag gagcatcaacacc gcgcacacaccc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccagagct ccaagatcac acagctcac agggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgccccggg agcggatgcg tcctcttcat gcgaggatgcg	cggtcgctgg ggaggtgagg gacgcccac caggaagagg gtacatggcg cgggaaggcg ccacctcgtc caagatgctc cgcggcggc cgtgctggtg cctcgactcg ccacctcctc agcctcacc agccttcaag cgggccggcg cgtgctgag ggacgacg catcacag cggcaccac agcatcag cggcaccag ggacgacg gattgagag ggattgggg	tacgagcgga aaggcacagc aactgtgtct ctcgccgatc tacatgcacc ccgtcgctgg gcggcacaga ttctgcacta ggcctgccc acggtgctcc gtctgctcgg ctggtcgcc gactgctgcg aaggacgtgcc gactcggagg aaggacgtgc atcctcgaca cacgtcctct atgcgcaagc gtcctctttg	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga tcgacgactga tcgatgacgactga tcgatgacgactga tcgacgactg tggtgaggc	gatccagatg gccggcgacg ctacccggac gttcaagagg gatcctggag ggacatagtt ggagtgggc ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggacggc gctgttccag cggcacctc ctccaagaac gaactcgtc aaaggtaaac caacatgtcc ggatggtcac cggctcacc	120 180 240 300 360 420 480 540 600 660 720 780 900 960 1020 1140 1200 1260
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gtgctgcgacga gtgctgcgacg cagccgcggt ggcgccgact atgtaccagc gaaaacaacc cgcggccgcg gctgcgcgg ttgtgtggg agggaggtcg atggaggtcg atggaggtcg atcgagcgcg gttttgggtgg ctcaacaagg accaccaccg gtcgagaccg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccaagatcac acaggctcac agggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgacccggg agggatgcat cgcacccggg agcggatgcat tcctcttcat gcgagggaat	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcc caacetcgtc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctgccg ccactcctc agccttcaag cgggccgcg tgccaccagg catggaccgg ggatggacgag cgggccgcg	tacgagegga aaggeacage aactgtgtet ctegeegate tacatgeacg geggeacaga ttetgeacta ggeetggee acggtgetee gtetgetegg ctggteggee gaegtgteeg gaeteggag aaggaegtge cegeteggea atcetegaac acgeteetet atgeeaca atcetegaac atgeecate atgeeacat atgegeaage	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tcaaggagaa acgcgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagggccc gcgccatcga ccgggctcat tcgacgactg tggtgagggc ccgagtacgg gctctctcggg	gatccagaty geeggegaeg ctacceggae gttcaagagg gatcetggag ggacatgcca ggacatgcca gcgcctcatg ggacctggct cgtgaccttc cggggaeggc gctgttccag eggccacctc ctccaagaac gaactcegtc aaaggtaaac caacatgtcc ggatggtcacc teggatggtaccc taaaggtaaac cagcctcacct	120 180 240 300 360 420 480 540 600 720 780 840 900 1020 1080 1140 1200 1260 1320
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gcgtcgaggt ggcgccgcgt ggcgccgcgc gctgtcgag ctgtgccgcgg ttttgggag atcgaggtcg gcgcgcgc gctgcgcgg ctggtgtcg atggaggtcg atcgagggg ttttgggtgg ctcaacaagg agcgcaccg gtcgagaccg gtcaaccaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgagaccg gtccatctc	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccaagatcac acaggctcac acggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgcacccggg agcggatgcg tcctcttcat gcgagggatgca cgtgaggatgcg	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgacctcgtc cagatgctc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctcctc agccttcaag cgggccggcg tgccaccagg gattggagg catgaccagg catgaccagg catgaccagg catgaccagg catgacagg catgacagg catgacaga	tacgagegga aaggeacage aactgtgtet ctegeegate tacatgeace cegtegetgg geggeacaga ttetgeacta aggeetgeec acggtgetee getggtegee gaegtgteeg gaeteggagg aaggaegtge cegeteggea atectegaca cacgteetet atgegeaca gteetett gtegeeggea	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gctcgccaa agatcacggc aggcgctctt tcgagggccc gcgccatcga ccgggtcat tcgacgactg tcgtggaggc ccgagtacgg gctctcggcga gctctcggcca tcgacgactg	gatccagaty geeggegaeg ctacceggae gttcaagagg gatcetggag ggacatgcca ggacatgcca gegectcaty ggacctgget eggacette egggaegge getgttccag eggecaecte ctccaagaae gaactcegte aaaggtaaae caacatgtee ggatggteae ttgategaty geegecteaee	120 180 240 300 360 420 480 540 600 720 780 840 900 1020 1080 1140 1200 1260 1320 1380
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgaca gagaacccca gcgcgcggcg cagcgcgggt ggcgccgact atgtaccagc gaaaacaacc cgcggccgg ctgtgtgtcgg agggaggtcg atcgagggcg ttttgggtgg ctcaacaagg agcacaccg gtcgagaccg gtcgagaccg ctgagagcgcg ttttgggtgg ctcaacaagg agcacaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgagaccg gtcgatccatctc ctgctatcca	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccagaagct ccaagatcac acaggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgcacceggg agcggatgcg tcctcttcat gcgagggaat tcgtctctcat gcgagggaat gcgagtcat agcgattcac agcgattcactt	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cggaaggcg ccacctcgtc cagcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctcctc agccttcaag cgggccggcg tgccaccagg catggacgag ggattggggc catgacgag tgccaccagg catgacgag tattgtattc	tacgagegga aaggeacage aactgttet ctegeegate tacatgeace cegtegetgg geggeacaga ttetgeacta aggeetgee getgteeggee gaetggteeggee gaeteggagg aaggaegtge cegeteggea atectegaca caegteeted atgegeaca gteetet gtegeegea atcetegaca caegteetet atgegeaca gteetett atgegeaca atgeacaca atgeacaca	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga ccgggttcat tcgacgactg tcgtggaggc ccgagtacgg gctctcgacgac gctctcgacga	gatccagaty gecggegaeg ctacceggae gttcaagagg gatcetggag ggacatggeg ggacatgca ggaccteaty ggacctgget cgtgacette cggggaegge gctgttccag cggccacete ctccaagaae gaactcegte aaaggtaaae caacatgtee ggatggteae ctggectcaee ttgatcgatg gccgccgceg	120 180 240 300 360 420 480 540 600 720 780 840 900 1020 1080 1140 1200 1260 1320
<211> 1531 <212> DNA <213> Lolin <400> 57 gactcattca gactgtcgag gccgcgacga gtgctggcca tactacttca atgtgcgac gagaacccca gcgcgcggt ggcgccgact atgtaccagc gaaaacaacc cgcggccgcg gctgccgcg gctgccgcg tttgggtgcg atggaggtcg atggaggtcg atcgaggcgcg gttttgggtg gctcaacaagg accaccaccg gtcgagaccg gtcgagaccg gtcgagaccg accaccaccg gtcgagaccg gtcgatcca attcgttccg	tctgtcgtct ctaccactgc tgaccgtgga tcggcacggc agatcaccaa agtctcagat acatgtgcgc tccagaagct ccaagatcac acaggctgctt gcggcgcgcg acgagtcaca tgataatcgg cgagccagac gcctcacctt ccctggagga cgcacceggg agcggatgcg tcctcttcat gcgagggaat tcgtctctcat gcgagggaat gcgagtcat agcgattcac agcgattcactt	cggtcgctgg ggaggtgagg gacgcccgct gagcgaccac caggaagagg gtacatggcg cgggaaggcc caacetcgtc cgcggcggc cgtgctggtg cctcgactcg cgcgacccc catcctcctc agccttcaag cgggcacgac gggacgacgc catcgactcg ccacatcatc cgcggcgc tgccaccagg catggacgag ggattgggg catggacgag catggacgag catggacgag catgatgccc ccacatcgat tattgtattc gcttgtgcg	tacgagegga aaggeacage aactgtgtet ctegeegate tacatgeace cegtegetgg geggeacaga ttetgeacta ggeetgegee acggtgeteeg gaegtgteeg gaeteggag aaggaegtge cegeteggea atcetegaac acgeteete atgegeaca atcetettg attgeegetg gatacetet atgegeaage ctegetege gteetetteg attgeegetg atgeacace ctetttg attgeegetg gatacetec cgtacacetg	cgtaaggaga gggcgaggg accaggctga tcaaggagaa tgacggagga acgcgccaa aggcgatcaa cctctggtgt cgtcggtgaa gcctcgccaa agatcacggc aggcgctctt tcgagcgccc gcgccatcga ccgggttcat tcgacgactg tcgtggaggc ccgagtacgg gctctcgacgac gctctcgacga	gatccagaty gecggegaeg ctacceggae gttcaagagg gatcetggag ggacatggeg ggacatgca ggaccteaty ggacctgget cgtgacette cggggaegge gctgttccag cggccacete ctccaagaae gaactcegte aaaggtaaae caacatgtee ggatggteae ctggectcaee ttgatcgatg gccgccgceg	120 180 240 300 360 420 480 540 600 720 780 840 900 1020 1080 1140 1260 1320 1380 1440

```
<210> 58
<211> 774
<212> DNA
<213> Festuca arundinacea
<400> 58
acaqatqtac ttcgtgtcca agtccctggc ggagaacgcc gccatggact acgccaaaga
                                                                      60
                                                                     120
gaacggcgtg gacttcatca gcatcatccc cacgctcgtc gtcggcccct tcctcagcgc
cggcatgccg cccagcctgg tcaccgccct ggcactcatc acggggaacg aggcccacta
                                                                     180
ctcgatcctg aagcaggtgc agctggtcca cctggacgac ctctgcgact ccatgaccta
                                                                     240
cctcttcgag cacccggacg ccaacggccg ctacatctgc tcctcccacg acaccaccat
                                                                     300
                                                                     360
tcatggcatc gccaggatgc tcaaggagag gttccccgag tacgacatcc cacagaaatt
                                                                     420
cccqqqaqcc qacqacqacc ttcagccgat ccacttcttc ttcaagaagc tgctcgacca
cgggttcagg ttcaggtaca ccgccgagga catgttcgac gccgcggtct ggacgtgcag
                                                                     480
ggagaagggc ctgattccgc tcggagcgga aggggcaggc ggcccggcca gtgcagccgg
                                                                     540
                                                                     600
caagctggga gctgttctcg tgggcgaagg tcaggcgatt ggtgctgaga cataagcgct
agtgcatgta cactaggctg gctacctcag acacatggtg gagcgatgat tatgttcgtt
                                                                     660
                                                                     720
aattctacta tcctatattt cqqttcaqaa attgcattaa gagaaccctg taattggtgg
                                                                     774
gatattatga acggattatg gaacgcaaat aacttcatga cggaaaaaaa aaaa
<210> 59
<211> 1211
<212> DNA
<213> Lolium perenne
<400> 59
                                                                      60
gggagcacca cacatggcga ctgaagccaa gggggagacg gtgctggtca ccggcgccag
eggetteate ggeteetgge tegteegeet ceteetegee egeggetaet eegteeaege
                                                                     120
                                                                     180
cgccgtcctc aaccccgatg acaaggccga gacggaccac ctcctcgcgc tcgccgctgc
ggccggcgac gagggccgca tccgcttctt caggtgcgac ctcctcgacg gcgccgccat
                                                                     240
gctcgccgcc gtgcggggat gctccggcgt gttccacctc gcctctccct gcaccgtcaa
                                                                     300
cctcgtcctc aacccccaaa aggagcttgt ggtgccggcg gtggagggca cgctcaacgt
                                                                     360
gctgcgcgcc gccaaggaag ctgggggagt gcggcgggtg gtggtgacct cctccgtctc
                                                                     420
                                                                     480
cqccctcqtc ccctqcccgg ggtggccggc cggcgaggtc ctcgacgagc gctgctggac
cgacatcgac tactgcgaca agaacggggt ttggtaccct gcttcaaagg cactggcgga
                                                                     540
gaaggcggca tggaagtttg cagaggagaa tggactggat gtggtgacgg tcaatccagg
                                                                     600
                                                                     660
gacggttttg ggcgagatga ttccgccaag gctcaatgcc agcatggcca tgtttcttcg
cttacttgaa ggttgcaaag aggagtatgc agatttcttc atcgggccag tgcacgtgga
                                                                     720
agacqttqca ttaqcccata ttctqctqta cgagaatccg tcaqcatccg ggaggcacct
                                                                     780
ctgcgtggag cccatctgtc actggagtgt tttcgcggcg aaagtcgccg agctctaccc
                                                                     840
tgattacaaa gttccaaaat tccctgagga cacacagcct gggctggtga gggcgaaggc
                                                                     900
                                                                     960
ggtgccaaaa aagctgatgg cgttgggttt gcagttcact cctcttgaga agatcatcag
ggatgccgtg gagagcctca agagcagagg atgcatcgcc tgatgattgg atcgttaggc
                                                                    1020
                                                                    1080
ccagcccagt gcctacccag accatatact taccagtatg atttgtgcaa taacagccgg
                                                                    1140
ttgatgtacg gcatcacctg ccctacactt gggatgcgga tgctgtcaca ctgactccct
                                                                    1200
                                                                    1211
caaaaaaaa a
<210> 60
<211> 1229
<212> DNA
<213> Lolium perenne
<400> 60
ggctcaacca agggcaaagt gtgtgtaact ggggcttcag gctttgttgc ctcttggctc
                                                                      60
atcaagaaac teettgagte tggatateat gtgataggga etgteagaga eecagggaat
                                                                      120
cgaagaaagg tgggacacct ttggaaacta ccaggtgcaa atgagaggct ccaacttgtg
                                                                      180
agagctgatc tattggagga agggagcttt gacgatgctg taagggcttg tgagggtgtc
                                                                      240
ttccacattg cgtcgcctgt ccttgggaaa tctgattcca attgcaagga agcaacactc
                                                                      300
ggtcctgcaa tcaatggtac cctcaacgtg ctaagatcct gcaagaagag tccatttctc
                                                                      360
aaaagggttg ttctcacatc ttcatcatcc gcggtaagga ttagggatga aactcagcag
                                                                      420
ccagaactgt tatgggatga aacgacatgg agctctgtgc cactctgtga aaagctacag
                                                                      480
ctatggtatg ccctggcaaa ggtatttgca gagaaagcag cattggactt tgccaaggag
                                                                      540
                                                                      600
aataacattg accttgtgac agttcttcca tcattcgtaa ttggacccag tttatcccat
gaattgtgca ctactgcttc agatatcctt ggcttacttc aaggtgacac agacaggttc
                                                                      660
actttgtacg gaaggatggg atatgttcac atcgatgatg ttgcccggag ccacattcta
                                                                      720
```

gtgtacgaaa caccgga aatgaattgg ttggctt aagaacccct atggaaa ctcaagttca aaggagt ggccattgac aagccat agtcatagat tttttt catcaattgt cagcggga atgaaatat tgaaaca	act ggcaaaacag gca ggcataccag gca ggagatgttt gcc gttgtgataa agc caaacacatc ttc tcttcaaata aga ttaaatgtgt	tttccagtat ctagacacat aacgactgcg cagagacagc tcaactatgc attcccatgt	tccccattcc ccaagctcca tcgaatcgct attgacaagc ctgaatcatg actctcctta	aaggaggctc ggggctgggt gaaagatcag catagccaaa tcagttctcg ctataccgaa	780 840 900 960 1020 1080 1140 1200 1229
<210> 61 <211> 1439 <212> DNA <213> Lolium perer	nne				
<pre><400> 61 aaacgactcc aacgaa gaggatggcg ccggtgg cgaggtgccc gtcatct ccgcgtggcg gcgggg cgccgcgctc atcgcc ggacaagctc cgctacg gcaggacgg gagacgg catgggcgg gagacgg catgggcgg gagacgg gcagtacagc gagacgg ggtcaacttc taccca cgacgcggg accatca cgacggggg accacc cgacggggg accacc ggtgaacggg catggggg catgggg catggggg accacc ggtgaacggg catggggg accacc ggtgaacggg catggggg catgggg catggggg catggggg catggggg catggggg catggggg catggggg catgggg catggggg catgggg catggggg catggggg catggggg catggggg catggggg catggggg catggggg catggggg catggggg catgggg catggggg catgggg catggg catggg catggg catggg gg gg</pre>	gtgg agagagegee gaeg aggaegageg egee tecaeggeat egeg aggggtgggg gaga tggeeagge gtee aggaetggeg gtee aggaetggeg gtee aggaetggeg ggee ggtggeegga etea tggegetgte agg ecetgteeaa agg ececeagee acce tecteetea egga teaeeggae egga ggetgteeat egga ggetgteeat egge ggaggggg egee geaagatgge egge geaagetgge eaace agattettg acta tategtatta etgag taattateta	cttcctgccg gcccaaggtg cgacgacgcg catcttccag ctcgcggac caagaaggcg gagatcgtg caagcccgcg ctgcaagctg ggcgtgcgtg cgacctcacc ggacctcacc ggacctcacc gaggtttaag cgccacgtt ggaggacac gcgcgacct gctgcagctc gctgcagcac acataagtaa gtatatacac	acgggggagg gcgcacgacc cggaggaccg gtcgtcgacc ttcttcgcg ggattcatcg acctacttct gggtggcgc ctcggcgtcc gacatggacc ctcggcctca ggcggactcc ggcgcattcg aacgcggacc cagaacccgg atcctggagg gagctcgcca gaggccgcct tatctttat atttgtctgc	ccacgctgcg gcttcagcga agatccggga acgcgctcga tccccgccga tctccagcca cgtacccggt cggtggtgga tgtcggaggc agaaggtggt agcgccacac aggccacac acgccgcgc tcgtcaacct accaggcgt cgccgacgc agccatcac agccatcac agccatcac agccatcac agcgcatcac agcgcatcac agcgcatcac agcgcatcac aggcgatcac agcgcatcac aggcgat	60 120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020 1140 1200 1260 1320 1380
<pre>cacatgagtt tgctgtc <210> 62 <211> 1320 <212> DNA <213> Festuca arm</pre>	gtgc agaaattgaa	cgcattcggt	actgctttca	aaaaaaaa	1439
<pre><400> 62 gaaacggccc tgcact. ccgccacgcc cacgca gcgccgttcc tgccga gacgaggacg agcgac tcgctccacg gcatcg gcgcgtgcg aagggt gtcgccgaga tggcca cgctacgaca tgtccg gagacggtcc aggact gactacggc gatggc gagcggtca tggcgc gagacggagg ccctgt taccccaagt gcccc acatcaccc tcctcc acacctgga ggcgct gagaggaggagg gcccc acatcaccc tcaccc acacctgga ggcgca gagagcagca ggcgca gagagcagca ggcgca gagagcagca ggcgca tcaccg gccactact tgagca gagagcagca ggctgt ccgctggcgg taaggg atgtaccgcc gcaaga</pre>	ccac tttacggggc cggc ggcgacgggc ccaa ggtggcgcac atga tggcggcgcg gggc ctcccgcgag ggct ctcccgcgag gcgg caagaaaggt ggcg ggagatcgtg cgaa gacgctgcg tgtc gtgcaagctg ccaa ggcgtgcgtg tcca ggcctcacc tcca ggacctcac tcca ggacttcac acgg gaggttaag ccat cgccacgttc aggg ggaggacacc	cgatcggatc gaggccacgc gaccgcttca cggagggccg gtcgtcgacc ttcttcgcac ggattcatcg acctacttct gggtggcgcg ctgggggtgc gacatggacc ctcgggctca ggcggactcc ggcgccttcg gacgggacc cagaacccgg atactggag	ggatggcgtc tgcggccgtc gcgacgaggt agatccggga acggcgtcga tccccgccga tctccagcca cgtacccggt cggtggtgga tgtcggaagc agaaggtggt agaggtcacaca cggcactcg tcgtcaacct accaggcggt cgccagaagc agccatcac	ggtggagaac cttcgtgcgg gccggtcatc ccgcgtggcg cgcgccctc ggacaagctc cctccagggc gaaggcgcgg catgggcctg ggtcaacttc cgaccccggc cgacggcggc cggcgaccac ggtcaacggg gaaggtgtgg cttcaccgag	60 120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140

gccgaccagc tcaagcagca gctgcagcag gagcagcagg aggcggtggc cgccgccgcg cccaagcccg ccaccaccaa gcccctcaac cagattcttg cctagattcc atgtatatgt

<210> 63 <211> 654 <212> PRT <213> Lolium perenne <400> 63 Met Glu Ser Ser Ala Val Val Pro Gly Thr Thr Ala Pro Leu Leu Pro 1 5 10 Tyr Ala Tyr Ala Pro Leu Pro Ser Ser Ser Asp Asp Ala Arg Glu Asn 2.5 Arg Ser Ser Gly Gly Val Arg Trp Arg Ala Cys Ala Val Val Leu Ala 35 40 Asp Ser Ala Leu Ala Val Val Val Val Gly Leu Leu Ala Gly Gly 55 60 Arg Val Asp Arg Val Pro Ala Gly Ala Asp Val Ala Ser Ala Thr Val 70 75 Pro Ala Val Pro Met Glu Phe Pro Arg Ser Arg Gly Lys Asp Leu Gly 90 85 Val Ser Glu Lys Ser Ser Gly Ala Tyr Ser Ala Asp Gly Gly Phe Pro 105 110 Trp Ser Asn Ala Met Leu Gln Trp Gln Arg Thr Gly Phe His Phe Gln 120 125 115 Pro Glu Gln His Tyr Met Asn Asp Pro Asn Gly Pro Val Tyr Tyr Gly 130 135 140 Gly Trp Tyr His Leu Phe Tyr Gln His Asn Pro Lys Gly Asp Ser Trp 145 150 155 160 Gly Asn Ile Ala Trp Ala His Ala Val Ser Lys Asp Met Val Asn Trp 170 175 1.65 Arg His Leu Pro Leu Ala Met Val Pro Asp Gln Trp Tyr Asp Ser Asn 185 180 Gly Val Leu Thr Gly Ser Ile Thr Val Leu Pro Asp Gly Gln Val Ile 205 200 Leu Leu Tyr Thr Gly Asn Thr Asp Thr Leu Ala Gln Val Gln Cys Leu 215 220 Ala Thr Pro Ala Asp Pro Ser Asp Pro Leu Leu Arg Glu Trp Ile Lys 230 235 His Pro Ala Asn Pro Ile Leu Phe Pro Pro Pro Gly Ile Gly Leu Lys 245 250 255 245 Asp Phe Arg Asp Pro Leu Thr Ala Trp Phe Asp His Ser Asp His Thr 260 265 Trp Arg Thr Val Ile Gly Ser Lys Asp Asp Asp Gly His Ala Gly Ile 280 285 Ile Leu Ser Tyr Lys Thr Lys Asp Phe Val Asn Tyr Glu Leu Met Pro 290 295 300 Gly Asn Met His Arg Gly Pro Asp Gly Thr Gly Met Tyr Glu Cys Ile 310 315 320 Asp Leu Tyr Pro Val Gly Gly Asn Ser Ser Glu Met Leu Gly Gly Asp 325 335 330 Asp Ser Pro Asp Val Leu Phe Val Leu Lys Glu Ser Ser Asp Asp Glu 345 350 340 Arg His Asp Tyr Tyr Ala Leu Gly Arg Phe Asp Ala Val Ala Asn Val 365 360 Trp Thr Pro Ile Asp Arg Asp Leu Asp Leu Gly Ile Gly Leu Arg Tyr 380 375 Asp Trp Gly Lys Tyr Tyr Ala Ser Lys Ser Phe Tyr Asp Gln Lys Lys 390 395 Asn Arg Arg Ile Val Trp Ala Tyr Ile Gly Glu Thr Asp Ser Glu Gln 410 405 Ala Asp Ile Thr Lys Gly Trp Ala Asn Leu Met Thr Ile Pro Arg Thr 425 430 420 Val Glu Leu Asp Arg Lys Thr Arg Thr Asn Leu Ile Gln Trp Pro Val

440

Glu Glu Val Asp Thr Leu Arg Arg Asn Ser Thr Asp Leu Gly Arg Ile 455 Thr Val Asn Ala Gly Ser Val Ile Arg Leu Pro Leu His Gln Gly Ala 470 475 Gln Leu Asp Ile Glu Ala Ser Phe Gln Leu Asn Ser Ser Asp Val Asp 490 495 485 Ala Ile Asn Glu Ala Asp Val Gly Tyr Asn Cys Ser Thr Ser Gly Ala 500 505 510 Ala Val Arg Gly Ala Leu Gly Pro Phe Gly Leu Leu Val Leu Ala Asn 515 520 525 515 520 Gly Arg Thr Glu Gln Thr Ala Val Tyr Phe Tyr Val Ser Lys Gly Val 530 535 540 Asp Gly Gly Leu Gln Thr His Phe Cys His Asp Glu Ser Arg Ser Thr 545 550 555 Arg Ala Lys Asp Val Val Asn Arg Met Ile Gly Ser Ile Val Pro Val 575 570 565 Leu Asp Gly Glu Thr Phe Ser Val Arg Val Leu Val Asp His Ser Ile 580 585 Val Gln Ser Phe Ala Met Gly Gly Arg Ile Thr Ala Thr Ser Arg Ala 595 600 605 Tyr Pro Thr Glu Thr Ile Tyr Ala Ala Ala Gly Val Tyr Leu Phe Asn 610 615 620 Asn Ala Thr Gly Ala Thr Val Thr Ala Glu Arg Leu Val Val His Glu 630 635 640 Met Ala Ser Ala Asp Asn His Ile Phe Thr Asn Asp Asp Leu 650

<210> 64

<211> 648

<212> PRT <213> Festuca arundinacea

<400> 64

Met Glu Ser Ser Ala Val Val Pro Gly Thr Thr Ala Arg Leu Leu Pro 5 10 Tyr Ala Tyr Ala Pro Leu Pro Ser Ser Ala Asp Asp Ala Arg Glu Asn 25 Gln Gly Ser Asp Gly Val Arg Trp Arg Ala Cys Ala Ala Val Leu Ala 40 Ala Ser Ala Leu Ala Val Leu Val Val Val Gly Leu Leu Ala Gly Gly 50 55 Arg Val Asp Arg Pro Gly Pro Ala Ala Val Pro Ala Val Pro Thr Glu 65 70 75 Ile Pro Arg Ser Arg Gly Lys Asp Phe Gly Val Ser Glu Lys Ser Ser 90 85 Gly Ala Tyr Ser Ala Asp Gly Gly Phe Pro Trp Ser Asn Ala Met Leu 110 100 105 Gln Trp Gln Arg Thr Gly Phe His Phe Gln Pro Glu Gln His Tyr Met 115 120 125 Asn Asp Pro Asn Gly Pro Val Tyr Tyr Gly Gly Trp Tyr His Leu Phe 130 135 140 Tyr Gln Tyr Asn Pro Lys Gly Asp Ser Trp Gly Asn Ile Ala Trp Ala 155 150 His Ala Val Ser Lys Asp Met Val Asn Trp Arg His Leu Pro Leu Ala 170 175 Met Val Pro Asp Gln Trp Tyr Asp Ser Asn Gly Val Leu Thr Gly Ser 185 190 180 Ile Thr Val Leu Pro Asp Gly Arg Val Ile Leu Leu Tyr Thr Gly Asn 200 205 195 Thr Asp Thr Leu Ala Gln Val Gln Cys Leu Ala Glu Pro Ala Asp Pro 220 210 215 Ser Asp Pro Leu Leu Arg Glu Trp Ile Lys His Pro Ala Asn Pro Ile 235 230 Leu Phe Pro Pro Pro Gly Ile Gly Leu Lys Asp Phe Arg Asp Pro Leu 245 250 255 Thr Asp Trp Phe Asp His Ser Asp Asp Thr Trp Arg Thr Val Ile Gly

			260					265					270		
Ser	Lys	Asp 275		Asp	Gly	His	Ala 280		Ile	Ile	Leu	Ser 285		Lys	Thr
Lys	Asp 290		Val	Asn	Tyr	Glu 295		Met	Pro	Gly	Asn 300	Met	His	Arg	Gly
Pro 305	Asp	Gly	Thr	Gly	Met 310	Tyr	Glu	Cys	Ile	Asp 315	Leu	Tyr	Pro	Val	Gly 320
_				325	Met				330					335	
			340		Ser			345					350		
	_	355			Ala		360					365			
	370				Ile	375					380				
385					Tyr 390 Thr					395					400
				405	Thr				410					415	
_			420		Ile			425					430		
		435			Asp		440					445			
	450				Leu	455					460				
465					470 Ser					475					480
				485	Ser				490					495	
	_		500		Leu			505					510		
		515			Val		520					525			
His	530 Phe	Cys	His	Asp	Glu	535 Ser	Arg	Ser	Thr		540 Ala	Lys	Asp	Val	
545 Asn	Arg	Met	Ile		550 Ser	Ile	Val	Pro		555 Leu	Asp	Gly	Glu	Thr	560 Phe
Ser	Val	Arg			Leu	Asp	His		570 Ile	Val	Gln	Ser		575 Ala	Met
Gly	Gly				Ala	Thr		585 Arg	Ala	Tyr	Pro	Thr 605		Ala	Ile
Tyr		595 Ala		Gly	Val	Tyr 615		Phe	Asn	Asn	Ala 620			Ala	Thr
Val 625		Ala	Glu	Arg	Leu 630			Туг	Glu	Met 635	Ala	Ser	Ala	Asp	Asn 640
		Phe	Arg	Asn 645	Asp	Asp	Leu								
-21	n> 6	5													
<21 <21	0> 6 1> 6 2> P	20 RT													
			ıca a	runa	inac	ea									
	0> 6 Glu		Arg	Ala 5	Phe	Pro	Asn	Ala	Ala 10	Туг	Ala	Pro	Leu	Leu 15	Pro
Pro	Thr	Ala	Asp		Ala	Thr	Leu	Gly 25		Gln	. Asp	Arg	Pro 30	Gly	Val
		35	Gly		Leu		40	Leu				45			
	50	. Val				55					60				Ala
Gly 65	Asp	Thr	Asp	Glu	Asp 70	Gly	Ala	Gly	Gly	Phe 75	Pro	Trp	Ser	Asn	Glu 80

Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln Pro Glu Gly His Phe Met Ser Asp Pro Asp Gly Pro Val Tyr Tyr Arg Gly Tyr Tyr His 100 105 Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp Asp Asp Tyr Ile 120 125 Glu Trp Gly His Val Val Ser Gln Asp Leu Val His Trp Arg Pro Leu 140 135 Pro Leu Ala Leu Arg Pro Asp His Trp Tyr Asp Lys Lys Gly Val Leu 145 150 155 Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu Val Leu Leu Tyr 165 170 175 Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln Cys Ile Ala Val 180 185 190 Pro Thr Asp Pro Asn Asp Pro Leu Leu Arg His Trp Thr Lys His Pro 200 205 195 Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln Gly Met Asp Phe 210 215 Arg Asp Pro Thr Ser Ala Trp Phe Asp Lys Ser Asp Ala Thr Trp Arg 225 230 235 Ile Leu Ile Gly Ser Lys Asp Asp Asp Asn Gly Ser His Ala Gly Ile 245 250 255 Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe Glu Arg Val Pro 265 Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp Glu Cys Ile Asp 280 Phe Tyr Pro Val Gly Gly Gly His Asn Ser Ser Ser Glu Glu Leu Tyr 290 295 300 Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp Tyr Tyr Ser Leu 310 315 Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro Leu Asp Ala Glu 330 335 325 Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Leu Tyr Ala 345 - 350 Ala Thr Ser Phe Tyr Asp Pro Leu Lys Gln Arg Arg Ile Met Leu Gly 355 360 Tyr Val Gly Glu Thr Asp Ser Ala Arg Ala Asp Val Ala Lys Gly Trp 375 380 Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Thr Leu Asp Glu Lys Thr 390 395 Arg Thr Asn Leu Leu Leu Trp Pro Val Glu Glu Val Glu Ala Leu Arg 410 415 Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Val Asp Asn Gly Ser Val 430 420 425 Phe His Leu Pro Leu His Gln Ala Thr His Leu Asp Ile Glu Ala Ser 435 440 445
Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn Glu Ala Asp Val 455 460 Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala Arg Gly Ala Ile 475 480 465 470 Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp Leu Arg Gly Glu 495 485 Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu Asp Gly Thr Leu 505 510 Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser Arg Ala Arg Asp 520 515 Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val Leu His Gly Glu 535 540 Ala Leu Ser Met Arg Val Leu Val Asp His Ser Ile Val Gln Ser Phe 550 555 560 Ala Met Gly Gly Arg Val Thr Ala Thr Ser Arg Val Tyr Pro Thr Glu 570 575 565 Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn Asn Ala Thr Gly 580 585 590 Ala Ser Val Thr Ala Glu Arg Leu Ile Val His Glu Met Ala Ser Ala 600

Val Tyr Asp Glu Thr Leu Ile Met Val Glu Asp Ser 61.0 <210> 66 <211> 623 -<212> PRT <213> Lolium perenne <400> 66 Met Glu Ser Arg Ala Phe Pro Ser Ala Ala Tyr Ala Pro Leu Leu Pro 10 Ser Ala Ala Asp Asp Val Ala Leu Ala Lys Gln Asp Arg Pro Gly Val 2.0 Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Cys Gly Val Val Val 40 Leu Leu Val Gly Ala Thr Leu Leu Ala Gly Ser Arg Met Gly Gln Ala 55 Gly Asp Gly Glu Gly Asn Thr Asp Glu Asp Gly Ala Gly Gly Phe Pro 70 75 Trp Ser Asn Glu Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln 90 85 Pro Glu Gly His Phe Met Ser Asp Pro Asn Gly Pro Val Tyr Tyr Arg 100 105 Gly Tyr Tyr His Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp 125 115 120 Asp Asp Tyr Ile Glu Trp Gly His Val Val Ser Gln Asp Leu Val His 135 140 Trp Arg Pro Leu Pro Leu Ala Met Arg Pro Asp His Trp Tyr Asp Lys 145 150 155 Lys Gly Val Leu Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu 165 170 Val Leu Leu Tyr Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln 180 185 190 Cys Ile Ala Val Pro Thr Asp Pro Asn Asp Pro Leu Leu Arg His Trp 195 200 205 Thr Lys His Pro Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln 220 210 215 Gly Met Asp Phe Arg Asp Pro Thr Ser Ala Trp Trp Asp Lys Ser Asp 225 230 235 240 Ala Thr Trp Arg Ile Leu Ile Gly Ser Lys Asp Asp Asp Asn Gly Ser 245 250 250 His Ala Gly Ile Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe 265 270 260 Glu Arg Val Pro Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp 285 280 Glu Cys Ile Asp Phe Tyr Pro Val Gly Gly His Asn Ser Ser Ser 300 295 Glu Glu Leu Tyr Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp 305 310 315 Tyr Tyr Ser Leu Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro 325 330 Leu Asp Ala Glu Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly 345 340 Lys Leu Tyr Ala Ser Thr Ser Phe Tyr Asp Pro Val Lys Gln Arg Arg 360 365 Ile Met Leu Gly Tyr Val Gly Glu Val Asp Ser Ala Arg Ala Asp Val 375 380 Ala Lys Gly Trp Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Ala Leu 390 395 Asp Glu Lys Thr Arg Thr Asn Leu Leu Trp Pro Val Glu Glu Val 405 410 415 Glu Ala Leu Arg Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Ile Asp 425 430

Asn Gly Ser Val Phe His Leu Pro Leu His Gln Thr Thr Gln Leu Asp

Ile Glu Ala Ser Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn 455 460 Glu Ala Asp Val Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala 470 475 Arg Gly Ala Leu Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp 490 495 485 Leu Arg Gly Glu Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu 500 505 510 Asp Gly Thr Leu Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser 515 520 525 Arg Ala Arg Asp Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val 530 535 540 Leu Asp Gly Glu Ala Leu Ser Met Arg Val Leu Val Asp His Ser Ile 550 555 Val Gln Ser Phe Ala Met Gly Gly Arg Thr Thr Ala Thr Ser Arg Val 575 565 570 Tyr Pro Thr Glu Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn 580 585 590 Asn Ala Thr Gly Ala Gly Val Thr Ala Glu Arg Leu Ile Val His Glu 595 600 605 Met Ala Ser Ala Val Tyr Asp Glu Thr Leu Met Val Glu Asp Ser 615 <210> 67 <211> 623 <212> PRT <213> Festuca arundinacea Met Glu Ser Arg Ala Phe Pro Ser Ala Ala Tyr Ala Pro Leu Leu Pro 1 5 10 Pro Thr Ala Asp Asp Ala Thr Leu Gly Lys Gln Asp Arg Pro Gly Val 20 25 Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Ser Gly Val Val Val 40 45 Leu Leu Val Ala Ala Ser Leu Leu Ala Gly Ser Arg Met Gly Gln Ala 55 Gly Asp Gly Glu Gly Asn Thr Asp Glu Asp Gly Ala Gly Gly Phe Pro 65 70 75 Trp Ser Asn Glu Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln 85 90 Pro Glu Gly His Phe Met Ser Asp Pro Asp Gly Pro Val Tyr Tyr Arg 100 105 110 Gly Tyr Tyr His Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp 125 120 Asp Asp Tyr Ile Glu Trp Gly His Val Val Ser Gln Asp Leu Val His 140 135 Trp Arg Pro Leu Pro Val Ala Met Arg Pro Asp His Trp Tyr Asp Lys 145 150 155 Lys Gly Val Leu Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu 170 175 165 Val Leu Leu Tyr Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln 185 190 180 Cys Ile Ala Val Pro Thr Asp Pro Asn Asn Pro Leu Leu Arg His Trp 195 200 205 Thr Lys His Pro Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln 220 210 215 Gly Met Asp Phe Arg Asp Pro Thr Ser Ala Trp Phe Asp Lys Ser Asp 235 240 225 230 Ala Thr Trp Arg Ile Leu Ile Gly Ser Lys Asp Asp Asn Gly Ser 245 250 255 His Ala Gly Ile Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe 265 Glu Arg Val Pro Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp

```
Glu Cys Ile Asp Phe Tyr Pro Val Gly Gly His Asn Ser Ser Ser
                  295
Glu Glu Leu Tyr Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp
               310 315
Tyr Tyr Ser Leu Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro
                           330 335
            325
Leu Asp Ala Glu Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly
      340 345 350
Lys Leu Tyr Ala Ala Thr Ser Phe Tyr Asp Pro Leu Lys Gln Arg Arg
355 360
Ile Met Leu Gly Tyr Val Gly Glu Thr Asp Ser Ala Arg Ala Asp Val
            375 380
Ala Lys Gly Trp Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Thr Leu
                              395
             390
Asp Glu Lys Thr Arg Thr Asn Leu Leu Leu Trp Pro Val Glu Glu Val
                           410
          405
Glu Ala Leu Arg Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Ile Asp
       420 425 430
Asn Gly Ser Val Phe His Leu Pro Leu His Gln Ala Thr Gln Leu Asp
     435 440 445
Ile Glu Ala Ser Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn
                  455 460
Glu Ala Asp Val Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala
              470 475
Arg Gly Ala Ile Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp
                                   4.95
                          490
            485
Leu Arg Gly Glu Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu
         500 505 510
Asp Gly Thr Leu Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser
    515 520 525
Arg Ala Arg Asp Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val
                535
                                  540
Leu Asp Gly Glu Ala Leu Ser Met Arg Val Leu Val Asp His Ser Ile
545 550
                               555
Val Gln Ser Phe Ala Met Gly Gly Arg Val Thr Ala Thr Ser Arg Val
                            570
            565
Tyr Pro Thr Glu Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn
                580
Asn Ala Thr Gly Ala Ser Val Thr Ala Glu Arg Leu Ile Val His Glu
 595 600 605
Met Ala Ser Ala Val Tyr Asp Glu Thr Leu Met Val Gln Asp Ser
 610
                  615
<210> 68
<211> 619
<212> PRT
<213> Lolium perenne
<400> 68
Met Glu Ser Arg Asp Phe Pro Ser Ala Ala Tyr Ala Pro Leu Leu Pro
            5
                          10
Ser Ala Ala Asp Asp Val Ala Leu Ala Lys Gln Asp Arg Pro Gly Val
       20
                        25
Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Cys Gly Val Val Val
                                      4.5
Leu Leu Val Ala Ala Ser Leu Leu Ala Gly Ser Arg Met Gly Gln Ala
 50 . 55
Gly Asp Thr Asp Glu Asp Gly Ala Gly Gly Phe Pro Trp Ser Asn Glu
                                75
                70
Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln Pro Glu Gly His
            85 · 90
Phe Met Ser Asp Pro Asp Gly Pro Val Tyr Tyr Arg Gly Tyr Tyr His
                               110
         100
                       105
Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp Asp Asp Tyr Ile
                      120
```

Glu	Trp 130	Gly	His	Val	Val	Ser 135	Gln	Asp	Leu	Val	His 140	Trp	Arg	Pro	Leu
Pro 145	Leu	Ala	Met	Arg	Pro 150	Asp	His	Trp	Tyr	Asp 155	Lys	Lys	Gly	Val	Leu 160
	_		Ile	165					170					175	
			Thr 180					185					190		
		195	Pro				200					205			
	210		Val			215					220				
225			Thr		230					235					240
			Gly	245					250					255	
			Phe 260					265					270		
_		275	His				280					285			
	290		Val			295					300				
305			Ala		310					315					320
			Asp Gly	325					330					335	
			340 Phe					345					350		
		355	Asp				360					365			
	370		Gln			375					380				
385					390					395					400
-			Leu	405					410					415	
			Thr 420					425					430		
		435					440					445			
	450		Asp			455					460				
465			Cys Gly		470					475					480
			Val	485					490					495	
			500 Phe					505					510		
		515					520					525			
	530					535					540				
Val 545		Ala	Met	Arg	Val 550		. Val	Asp	H1S	555 555		Val	GIN	ser	560
Ala	Met	Gly	Gly	Arg 565		Thr	Ala	Thr	Ser 570		Val	Tyr	Pro	Thr 575	
Ala	Ile	Туг	Ala 580	Arg		Gly	Val	Tyr 585	Leu		Asn	Asn	Ala 590	Thr	
Ala	Ser	Val 595	Thr		Glu	Arg	Leu 600		· Val	. His	Glu	Met 605	Ala		Ala
Val	Tyr 610		Glu	Thr	Val	Met 615		. Lys	Asp	Ser	•				

<210> 69 <211> 422 <212> PRT <213> Festuca arundinacea

<400> 69 Met Asp Lys Leu Asn Gly Ser Ala Arg Leu Met Ile Val Ser Asp Leu 10 Asp His Thr Met Val Asp His His Asp Glu Glu Asn Leu Ser Leu Leu 20 Arg Phe Gly Ala Leu Trp Glu Ser Ala Tyr Cys Gln Asp Ser Leu Leu 40 35 Val Phe Ser Thr Gly Arg Ser Pro Thr Leu Tyr Lys Glu Leu Arg Lys 50 55 60 Glu Lys Pro Met Leu Thr Pro Asp Ile Thr Ile Met Ser Val Gly Ser 70 75 Glu Ile Thr Tyr Gly Glu Ala Met Val Pro Asp Asp Gly Trp Glu Glu 90 85 Tyr Leu Asn Asn Lys Trp Asp Arg Asn Ile Val Leu Glu Glu Thr Ala 100 105 110 Lys Tyr Ser Glu Leu Lys Leu Gln Pro Glu Thr Glu Gln Arg Pro His 115 120 125 Lys Val Ser Phe Leu Val Asp Lys Lys Ser Ala Gln Glu Val Ile Lys 130. 135 140 Ser Leu Ser Glu Lys Phe Glu Lys Arg Gly Val Asp Ala Lys Ile Ile 150 155 Tyr Ser Gly Gly Gln Asp Leu Asp Ile Leu Ala Gln Gly Ala Gly Lys 165 170 175 Gly Gln Ala Leu Ala Tyr Leu Leu Lys Lys Phe Ala Ser Cys Gly Lys 180 185 190 Thr Pro Asn Asn Thr Leu Val Cys Gly Asp Ser Gly Asn Asp Ala Glu 195 200 205 Leu Phe Ser Ile Pro Gly Val His Gly Val Met Val Ser Asn Ala Gln 215 220 Glu Glu Leu Leu Gln Trp His Ala Glu Asn Ala Lys Asp Asn Pro Lys 225 230 . 235 Val Ile His Ala Thr Glu Arg Cys Ala Ala Gly Ile Ile Gln Ala Ile 250 245 Gly His Phe Lys Leu Gly Pro Asn Ile Ser Pro Arg Asp Ile Glu Phe 260 265 270 Pro Tyr Val Lys Glu Asp Ser Phe Lys Pro Thr Ala Ala Val Val Lys 275 280 285 Phe Tyr Val Leu Cys Glu Lys Trp Arg Arg Ala Asp Val Pro Lys Ala 290 295 300 Asp Ser Val Ile Glu Tyr Phe Lys Asn Ile Thr Asp Ala Ser Gly Val 315 305 310 Ile Ile His Pro Ser Gly Leu Glu Leu Ser Ile His Ser Ser Ile Asp 325 330 Ala Leu Ala Ser Cys Tyr Gly Asp Lys Gln Gly Lys Lys Tyr Arg Ser 340 345 350 Trp Val Asp Arg Leu Val Ile Ser Gln Thr Ala Ser Asp Ser Trp Leu 355 360 365 Val Arg Phe Asp Leu Trp Glu Ala Glu Gly Asp Ala Trp Val Cys Cys 370 375 380 Leu Thr Thr Leu Ala Leu Asn Val Lys Pro Glu Thr Pro Gly Gly Phe 395 385 390 Val Val Thr His Ile His Lys Thr Trp Leu Lys Glu Tyr Ser Gly Asp 405 410 415 Glu Gln Ala Ser Lys Leu

<210> 70

<211> 422

<212> PRT

<213> Lolium perenne

```
Met Asp Lys Leu Asn Gly Ser Ala Arg Leu Met Ile Val Ser Asp Leu
                        10
Asp His Thr Met Val Asp His His Asp Glu Glu Asn Leu Ser Leu Leu
               25
      20
Arg Phe Gly Ala Leu Trp Glu Ser Thr Tyr Cys Gln Asp Ser Leu Leu
            40
   35
Val Phe Ser Thr Gly Arg Ser Pro Thr Leu Tyr Lys Glu Leu Arg Lys
         55
                             60
Glu Lys Pro Met Leu Thr Pro Asp Ile Thr Ile Met Ser Val Gly Ser
                             75
Glu Ile Thr Tyr Gly Glu Ala Met Val Pro Asp Asp Gly Trp Glu Glu
     85 90 95
Tyr Leu Asn Asn Lys Trp Asp Lys Ser Ile Val Leu Glu Glu Thr Ala
        100 105 110
Lys Phe Ser Glu Leu Lys Leu Gln Ala Glu Thr Glu Gln Arg Pro His
          120 125
Lys Val Ser Phe Leu Val Asp Lys Lys Thr Ala Gln Glu Val Ile Lys
 130 135 140
Ser Leu Ser Glu Lys Phe Glu Lys Arg Gly Val Asp Ala Lys Ile Ile
145 150
                             155
Tyr Ser Gly Gly Gln Asp Leu Asp Ile Leu Ala Gln Gly Ala Gly Lys
           165 170
Gly Gln Ala Leu Ala Tyr Leu Leu Lys Lys Phe Ala Ser Cys Gly Lys
                           190
               185
        180
Thr Pro Asn Asn Thr Leu Val Cys Gly Asp Ser Gly Asn Asp Ala Glu
              200
                           205
Leu Phe Ser Ile Pro Gly Val His Gly Val Met Val Ser Asn Ala Gln
 210 215
                        220
Glu Glu Leu Leu Gln Trp Arg Ala Glu Asn Ala Lys Asp Asn Pro Lys
225 230 235
Val Ile His Ala Thr Glu Arg Cys Ala Ala Gly Ile Ile Gln Ala Ile
         245 250 255
Gly His Phe Lys Leu Gly Pro Asn Val Ser Pro Arg Asp Val Glu Phe
                      265 270
Pro Tyr Val Lys Glu Asp Ser Phe Lys Pro Thr Ala Ala Val Val Lys
                                  285
    275 280
Phe Tyr Val Leu Cys Glu Lys Trp Arg Arg Ala Asp Val Pro Lys Thr
290 295 300
Asp Ser Val Ile Glu Tyr Phe Lys Asn Ile Thr Asp Ala Ser Gly Val
305 310 315
Ile Ile His Pro Ser Gly Leu Glu Leu Ser Ile His Ser Ser Ile Asp
            325 330 335
Ala Leu Ala Ser Cys Tyr Gly Asp Lys Gln Gly Lys Lys Tyr Arg Ser
                                    350
                       345
Trp Val Asp Arg Leu Val Ile Ser Gln Thr Ala Ser Asp Ser Trp Leu
                  360
                                   365
   355
Val Arg Phe Asp Leu Trp Glu Ala Glu Gly Asp Lys Trp Val Cys Cys
                               380
 370 375
Leu Thr Thr Leu Ala Leu Asn Val Lys Pro Glu Thr Pro Gly Gly Phe
385 390 395 400
Val Val Thr His Ile His Lys Thr Trp Leu Lys Glu Tyr Ser Gly Asp
           405
                  410
Glu Gln Ala Ser Lys Leu
```

<210> 71

<211> 1062

<212> PRT

<213> Festuca arundinacea

<400> 71

Met Ala Ala Gly Asn Glu Trp Ile Asn Gly Tyr Leu Glu Ala Ile Leu 5 10 Asp Ala Gly Ser Lys Leu Arg Pro Gln Gly Val Gln Leu Pro Pro Leu

PCT/NZ02/00239

Glu Thr Ala Pro Ala Leu Ala Ala Glu Glu Ser Gly Ala Ala Tyr Asn 40 Pro Thr Arg Tyr Phe Val Glu Glu Val Val Arg Ser Phe Asp Glu Gln 55 Ala Leu His Lys Thr Trp Thr Lys Val Val Ala Met Arg Asn Ser Gln Glu Arg Ser Asn Arg Leu Glu Asn Leu Cys Trp Arg Ile Trp Asn Val 85 90 Ser Arg Gln Lys Lys Gln Val Glu Trp Asp Tyr Thr Lys Glu Val Ala 100 105 110 Arg Arg Lys Leu Glu Gln Glu Leu Gly Ser Arg Glu Ala Ala Glu Asp 125 120 Leu Ser Glu Leu Ser Glu Gly Glu Lys Asp Thr Thr Thr Ala Lys Pro 135 140 Asp Ala Ala Thr Ala Gln Pro Ser Thr Asp Asp Gly Glu His Gln Gln 145 150 155 Pro Gln Pro Arg Thr Arg Leu Ala Arg Ile Asn Ser Glu Val Arg Leu 170 165 Val Ser Asp Asp Glu Glu Glu Gln Thr Lys Lys Arg Asn Leu Tyr Ile 190 180 185 Val Leu Ile Ser Ile His Gly Leu Val Arg Gly Glu Asn Met Glu Leu 200 205 Gly Arg Asp Ser Asp Thr Gly Gly Gln Val Lys Tyr Val Val Glu Leu 215 Ala Arg Ala Leu Ala Ala Thr Ala Gly Val His Arg Val Asp Leu Leu 225 230 235 Thr Arg Gln Ile Ser Cys Pro Asp Val Asp Trp Thr Tyr Gly Glu Pro 250 255 245 Val Glu Met Leu Glu Arg Leu Ser Ser Ala Asp Ala Asp Glu Asp Asp 265 270 Gly Glu Gln Ser Gly Gly Gly Ala Tyr Ile Val Arg Leu Pro Cys Gly Pro Arg Asp Gln Tyr Ile Pro Lys Glu Glu Leu Trp Pro His Ile Pro 290 295 Glu Phe Val Asp Arg Ala Leu Ser His Val Thr Glu Val Ala Arg Ala 305 310 315 Leu Gly Asp Gln Leu Gln Pro Pro Pro Thr Pro Ala Ala Gly Asp Gly 330 335 325 Ala Ala Leu Val Ala Ala Pro Ile Trp Pro Tyr Val Ile His Gly His 340 345 350 Tyr Ala Asp Ala Ala Glu Val Ala Ala Asn Leu Ala Ser Ala Leu Asn 355 360 Val Pro Met Val Met Thr Gly His Ser Leu Gly Arg Asn Lys Leu Glu 370 . 375 380 Gln Leu Leu Lys Leu Gly Arg Met Pro Gly Pro Glu Ile Gln Gly Thr 395 390 Tyr Lys Ile Ala Arg Arg Ile Glu Ala Glu Glu Thr Gly Leu Asp Thr 410 405 Ala Glu Met Val Val Thr Ser Thr Lys Gln Glu Ile Glu Gln Trp 425 430 420 Gly Leu Tyr Asp Gly Phe Asp Leu Met Val Glu Arg Lys Leu Arg Val 435 440 445 Arg Gln Arg Arg Gly Val Ser Ser Leu Gly Arg Tyr Met Pro Arg Met 455 460 Ala Val Ile Pro Pro Gly Met Asp Phe Ser Phe Val Glu Thr Gln Asp 470 475 Thr Ala Glu Gly Asp Gly Ala Asp Leu Gln Met Leu Ile Ala Pro Asp 495 485 490 Lys Ala Lys Lys Ala Leu Pro Pro Ile Trp Ser Asp Val Leu Arg Phe 500 505 510 Phe Thr Asn Pro His Lys Pro Met Ile Leu Ala Leu Ser Arg Pro Asp 515 520 525 Pro Lys Lys Asn Val Thr Thr Leu Leu Lys Ala Tyr Gly Glu Ser Arg 530 535 540 Gln Leu Arg Glu Leu Ala Asn Leu Thr Leu Ile Leu Gly Asn Arg Asp Asp Ile Glu Asp Met Ala Gly Gly Gly Gly Ala Val Leu Thr Ala Val 570 565 Leu Lys Leu Ile Asp Arg Tyr Asp Leu Tyr Gly Gln Val Ala Tyr Pro 585 580 Lys His His Lys Gln Thr Asp Val Pro His Ile Tyr Arg Leu Ala Ala 600 605 Lys Thr Lys Gly Val Phe Thr Asn Pro Ala Leu Val Glu Pro Phe Gly 615 620 Leu Thr Ile Ile Glu Ala Ala Ala Tyr Gly Leu Pro Val Val Ala Thr 630 635 Lys Asn Gly Gly Pro Val Asp Ile Leu Lys Ala Leu Asn Asn Gly Leu 645 650 655 Leu Val Asp Pro His Ser Ala Glu Ala Ile Thr Gly Ala Leu Leu Ser 660 665 Leu Leu Ala Glu Lys Ser Arg Trp Val Glu Cys Arg Arg Asn Gly Leu 685 675 680 Arg Asn Ile His Arg Phe Ser Trp Pro His His Cys Arg Leu Tyr Leu 690 695 700 Ser His Val Ser Thr Tyr Cys Asp Gln Pro Ser Pro His Gln Pro Leu 710 715 Arg Val Pro Leu Gly Leu Gly Ser Ser Thr Ser Phe Gly Ala Asp Asp 725 730 735 Ser Leu Ser Asp Ser Leu Arg Gly Leu Ser Leu Gln Ile Ser Val Asp 745 750 740 Ala Ser Ser Asp Leu Asn Ala Ala Asp Ser Ala Ala Ala Ile Met Asp 765 755 760 Ala Leu Arg Arg Arg Pro Ala Ser Glu Lys Pro Ala Ser Ser Gly Ala 770 775 780 Arg Ala Leu Gly Phe Ala Pro Gly Arg Arg Glu Ser Leu Leu Val Val 785 790 795 800 Ala Val Asp Cys Tyr Gly Asp Asp Gly Lys Pro Asp Val Lys Gln Leu 805 810 Lys Lys Ala Ile Asp Ala Ala Val Ser Val Gly Glu Cys Ala Gly Ala 820 825 Lys Gln Gly Tyr Val Leu Ser Thr Gly Met Thr Ile Pro Glu Ala Ala 845 835 840 Glu Ala Ile Lys Ala Cys Gly Ala Asp Val Ala Ser Phe Asp Ala Leu 860 855 Ile Cys Ser Ser Gly Ala Glu Leu Cys Tyr Pro Trp Lys Glu Leu Ala 865 870 875 880 Ala Asp Glu Glu Tyr Ser Gly His Val Ala Phe Arg Trp Pro Gly Asp 885 890 895 His Val Lys Ser Ala Val Pro Arg Leu Gly Ser Leu Glu Glu Ile Ala 900 905 910 Leu Ala Ile Asp Arg Pro Ala Cys Ser Val His Cys His Ala Tyr Ala 915 920 925 Ala Thr Asp Ala Ser Lys Val Lys Lys Val Asp Ser Ile Arg Lys Ser 935 940 Leu Arg Met Arg Gly Phe Arg Cys Asn Leu Val Tyr Thr Arg Ala Cys 945 950 955 960 Thr Arg Leu Asn Val Ile Pro Leu Ser Ala Ser Arg Pro Arg Ala Leu
965 970 975 965 Arg Tyr Leu Ser Ile Gln Trp Gly Ile Asp Leu Ser Lys Val Ala Val 980 985 990 Leu Val Gly Glu Thr Gly Asp Thr Asp Arg Glu Arg Leu Leu Pro Gly 1000 1005 Val His Lys Thr Leu Ile Leu Pro Gly Met Val Ala Arg Gly Ser Glu 1010 1015 1020 Glu Leu Leu Arg Gly Asp Asp Gly Tyr Thr Met Ala Asp Val Val Ala 1025 1030 1035 1040 Met Asp Ser Pro Asn Ile Val Thr Leu Ala Glu Gly Gln Ser Ala Ser 1055 1045 1050 Asp Leu Leu Lys Ala Ile 1060

<210> 72 <211> 1074 <212> PRT <213> Lolium perenne Met Ala Gly Asn Asp Trp Ile Asn Ser Tyr Leu Glu Ala Ile Leu Asp Ala Gly Gly Thr Ala Gly Asp Ile Ser Ala Ala Ser Val Ala Gly Gly 25 20 Asp Asp Gly Pro Gly Ala Gly Gly Gly Thr Ala Gly Glu Lys Arg Asp 40 35 Lys Ser Ser Leu Met Leu Arg Glu Arg Gly Arg Phe Asn Pro Ala Arg 60 55 Tyr Phe Val Glu Glu Val Ile Ser Gly Phe Asp Glu Thr Asp Leu Tyr 75 70 Lys Thr Trp Val Arg Thr Ser Ala Met Arg Ser Pro Gln Glu Arg Asn 8.5 90 95 Thr Arg Leu Glu Asn Met Ser Trp Arg Ile Trp Asn Leu Ala Arg Lys 100 105 110 Lys Lys Gln Ile Glu Gly Glu Glu Ala Ser Arg Leu Ser Lys Lys Arg 115 120 125 Leu Glu Arg Glu Lys Ala Arg Arg Asp Ala Ala Ala Asp Leu Ser Glu 135 140 Asp Leu Ser Glu Gly Glu Lys Gly Glu Asn Ile Asn Gly Ser Ser Val 155 145 150 His Asp Glu Ser Thr Arg Gly Arg Met Pro Arg Ile Gly Ser Thr Asp 165 170 175 Ala Ile Glu Val Trp Ala Asn Gln His Lys Asp Lys Lys Leu Tyr Ile 180 185 190 Val Leu Ile Ser Ile His Gly Leu Ile Arg Gly Glu Asn Met Glu Leu 195 200 205 200 Gly Arg Asp Ser Asp Thr Gly Gly Gln Val Lys Tyr Val Val Glu Leu 210 215 Ala Arg Ala Leu Gly Glu Thr Pro Gly Val Tyr Arg Val Asp Leu Leu 225 230 235 Thr Arg Gln Ile Ser Ala Pro Asp Val Asp Trp Ser Tyr Gly Glu Pro 245 250 255 Thr Glu Met Leu Ser Pro Arg Asn Ser Glu Asn Leu Gly Asp Asp Met 260 265 270 Gly Glu Ser Ser Gly Ala Tyr Ile Val Arg Ile Pro Phe Gly Pro Arg 275 280 285 Glu Lys Tyr Ile Pro Lys Glu Gln Leu Trp Pro His Ile Gln Glu Phe 295 Val Asp Gly Ala Leu Val His Ile Met Gln Met Ser Lys Val Leu Gly 305 310 315 Glu Gln Val Gly Arg Glu Arg Arg Val Trp Pro Val Val Ile His Gly 325 330 335 His Tyr Ala Asp Ala Gly Asp Ser Ala Ala Leu Leu Ser Gly Ala Leu 340 345 350 Asn Val Pro Met Val Phe Thr Gly His Ser Leu Gly Arg Asp Lys Leu 355 365 Glu Gln Leu Leu Lys Gln Gly Arg Gln Thr Arg Asp Glu Val Asn Ala 370 375 380 Thr Tyr Lys Ile Met Arg Arg Ile Glu Ala Glu Glu Leu Cys Leu Asp 395 385 390 Ala Ser Glu Ile Val Ile Thr Ser Thr Arg Gln Glu Ile Glu Lys Gln 410 415 405 Trp Gly Leu Tyr Asn Gly Phe Asp Val Thr Met Glu Arg Lys Leu Arg 425 430 420 Ala Arg Thr Lys Arg Gly Val Ser Cys Tyr Gly Arg Tyr Met Pro Arg 435 440 445 Met Ile Ala Ile Pro Pro Gly Met Glu Phe Ser His Ile Val Pro His 450 455 460 Asp Val Asp Leu Asp Gly Asp Glu Ala Asn Glu Val Gly Ser Gly Ser 470 475

Pro	Asp	Pro	Pro	Ile 485	Trp	Ala	Asp	Ile	Met 490	Arg	Phe	Phe	Ser	Asn 495	Pro
Arg	Lys	Pro	Met 500	Ile	Leu	Ala	Leu	Ala 505	Arg	Pro	Asp	Pro	Lys 510	Lys	Asn
Ile	Thr	Thr 515		Val	Lys	Ala	Phe 520	Gly	Glu	His	Pro	Gly 525	Leu	Arg	Asn
	530					535					540	Val			
545					550					555		Leu			560
_	_	_		565					570			Lys		575	
			580					585				Arg	590		
		595					600					Leu 605			
	610					615					620	Gln			
625					630					635		Leu			640
				645					650			Leu		655	
			660					665				Asp	670		
_		675					680					Ser 685			
	690					695					700	Asp			
705					710					715		Arg			720
_				725					730			Glu		735	
			740					745				Arg	750		
	_	755					760					Glu 765			
_	770					775					780				
785					790					795		Val			800
				805					810			Phe		815	
_	-		820					825				Leu	830		
		835					840					Gly 845			
	850					855					860				
865					870					875		Thr			880
				885					890)		Tyr		895	
_			900					905				Ala	910		
		915	,				920	Į.				925	ı		
	930					935	i				940				
945					950	1				955	•	Leu			960
				965	.				970)		Ile		975	
			980					985	•			Arg	990	l .	
Glu	Leu	995		. Met	: 'I'hr	: Val	Val 100		. Gly	7 Glü	ı ser	100	, asp 15	TUI	Asp

Tyr Glu Gly Leu Leu Gly Gly Val His Lys Thr Ile Ile Leu Lys Gly 1010

Ser Phe Asn Ala Ala Pro Asn Gln Leu His Ala Ala Arg Ser Tyr Ser 1025

Leu Glu Asp Val Ile Ser Phe Asp Lys Pro Gly Ile Ala Ser Val Glu 1045

Gly Tyr Leu Pro Asp Ser Leu Lys Ser Ala Leu Gln Gln Phe Gly Val 1060

Leu Asn

<210> 73 <211> 937

<212> PRT <213> Lolium perenne

<400> 73 Met Ala Ala Gly Asn Glu Trp Ile Asn Gly Tyr Leu Glu Ala Ile Leu 1 5 10 Asp Ala Gly Ser Lys Leu Arg Pro Gln Gly Val Gln Leu Pro Pro Leu 20 25 Glu Thr Ala Pro Ala Leu Ala Ala Glu Glu Ser Ser Ala Ala Tyr Asn 40 Pro Thr Arg Tyr Phe Val Glu Glu Val Val Arg Ser Phe Asp Glu Gln 55 60 Ala Leu His Lys Thr Trp Thr Lys Val Val Ala Met Arg Asn Ser Gln 70 75 Glu Arg Ser Asn Arg Leu Glu Asn Leu Cys Trp Arg Ile Trp Asn Val 85 90 Ser Arg Gln Lys Lys Gln Val Glu Trp Asp Tyr Thr Lys Glu Val Ala 100 105 110 Arg Arg Lys Leu Glu Gln Glu Leu Gly Ser Arg Glu Ala Ala Glu Asp 120 125 Leu Ser Glu Leu Ser Glu Gly Glu Lys Asp Thr Thr Ala Lys Pro 140 135 Asp Ala Ala Ala Gln Pro Ser Ala Asp Asp Gly Glu His Gln Gln 145 150 155 Pro Gln Pro Arg Thr Arg Leu Ala Arg Ile Asn Ser Glu Val Arg Leu 165 170 175 Val Ser Asp Asp Glu Glu Glu Gln Thr Lys Lys Arg Asn Leu Tyr Ile 180 \$185\$Val Leu Ile Ser Ile His Gly Leu Val Arg Gly Glu Asn Met Glu Leu 195 200 205 200 Gly Arg Asp Ser Asp Thr Gly Gly Gln Val Lys Tyr Val Val Glu Leu 215 Ala Arg Ala Leu Ala Ala Thr Ala Gly Val His Arg Val Asp Leu Leu 225 230 235 Thr Arg Gln Ile Ser Cys Pro Asp Val Asp Trp Thr Tyr Gly Glu Pro 250 255 245 Val Glu Met Leu Glu Arg Leu Ser Ser Ala Asp Ala Asp Asp Asp Asp 265 270 Gly Glu Gln Ala Gly Gly Gly Ala Tyr Ile Val Arg Leu Pro Cys Gly 285 280 Pro Arg Asp Gln Tyr Ile Pro Lys Glu Glu Leu Trp Pro His Ile Pro 295 300 Glu Phe Val Asp Arg Ala Leu Ser His Val Thr Glu Val Ala Arg Ala 310 315 Leu Gly Glu Gln Leu Gln Pro Pro Pro Ser Pro Ala Asp Gly Ala Val 330 325 Ala Ala Pro Ile Trp Pro Tyr Val Ile His Gly His Tyr Ala Asp Ala 345 350

Ala Glu Val Ala Ala Asn Leu Ala Ser Ala Leu Asn Val Pro Met Val

Met Thr Gly His Ser Leu Gly Arg Asn Lys Leu Glu Gln Leu Leu Lys

355 360 365

Leu 385	Gly	Arg	Met	Pro	Gly 390	Pro	Glu	Ile	Gln	Gly 395	Thr	Tyr	Lys	Ile	Ala 400
	Arg	Ile	Glu	Ala 405	Glu	Glu	Thr	Gly	Leu 410	Asp	Thr	Ala	Glu	Met 415	Val
Val	Thr	Ser	Thr 420		Gln	Glu	Ile	Glu 425		Gln	Trp	Gly	Leu 430		Asp
Gly	Phe	Asp 435	Leu	Met	Val	Glu	Arg 440	Lys	Leu	Arg	Val	Arg 445	Gln	Arg	Arg
Gly	Val 450		Ser	Leu	Gly	Arg 455		Met	Pro	Arg	Met 460	Ala	Val	Ile	Pro
Pro 465		Met	Asp	Phe	Ser 470		Val	Glu	Thr	Gln 475		Thr	Ala	Asp	Gly 480
	Gly	Arg	Ser	Gln 485	Met	Leu	Ile	Ala	Pro 490		Lys	Ala	Lys	Lys 495	
Leu	Pro	Pro	Ile 500		Ser	Asp	Val	Leu 505		Phe	Phe	Thr	Asn 510	Pro	His
Lys	Pro	Met 515		Leu	Ala	Leu	Ser 520		Pro	Asp	Pro	Lys 525		Asn	Val
Thr	Thr 530		Leu	Lys	Ala	Tyr 535		Glu	Ser	Arg	Gln 540		Arg	Glu	Leu
Ala 545		Leu	Thr	Leu	Ile 550		Gly	Asn	Arg	Asp 555		Ile	Glu	Asp	Met 560
	Gly	Gly	Gly	Gly 565	Ala	Val	Leu	Thr	Ala 570		Leu	Lys	Leu	Ile 575	Asp
Arg	Tyr	Asp	Leu 580		Gly	Gln	Val	Ala 585		Pro	Lys	His	His 590	Lys	Gln
Thr	Asp	Val 595		His	Ile	Tyr	Arg 600		Ala	Ala	Lys	Thr 605	Lys	Gly	Val
Phe	Ile 610		Pro	Ala	Leu	Val 615	Glu	Pro	Phe	Gly	Leu 620	Thr	Ile	Ile	Glu
Ala 625		Ala	Tyr	Gly	Leu 630	Pro	Val	Val	Ala	Thr 635	Lys	Asn	Gly	Gly	Pro 640
	Asp	Ile	Leu	Lys 645	Ala	Leu	His	Asn	Gly 650	Leu	Leu	Val	Asp	Pro 655	His
Ser	Ala	Glu	Ala 660	Ile	Thr	Gly	Ala	Leu 665	Leu	Ser	Leu	Leu	Ala 670	Glu	Lys
Ser	Arg	Trp 675	Val	Glu	Cys	Arg	Arg 680	Asn	Gly	Leu	Arg	Asn 685	Ile	His	Arg
Phe	Ser 690	Trp	Pro	His	His	Cys 695	Arg	Leu	Tyr	Leu	Ser 700	His	Val	Ser	Thr
Tyr 705	Суѕ	Asp	Gln	Pro	Ser 710	Pro	His	Gln	Pro	Leu 715	Arg	Val	Pro	Leu	Ala 720
Leu	Gly	Ser	Ser	Thr 725	Ser	Phe	Gly	Ala	Asp 730	Asp	Ser	Leu	Ser	Asp 735	Ser
			740		Leu			745					750		
Asn	Ala	Ala 755		Ser	Ala	Ala	Ala 760	Ile	Met	Asp	Ala	Leu 765	Arg	Arg	Arg
Pro	Ala 770		Glu	Lys	Pro	Ala 775		Ser	Gly	Ala	Arg 780		Leu	Gly	Phe
785					Glu 790					795					800
Gly	Asp	Asp	Gly	Lys 805	Pro	Asp	Val	Glu	Gln 810		Lys	Lys	Ala	Ile 815	Asp
Ala	Ala	Val	Ser 820		Gly	Glu	Суз	Ala 825	Gly	Ala	Lys	Gln	Gly 830	Tyr	Val
Leu	Ser	Thr 835		Met	Thr	Ile	Pro 840		Ala	Ala	Glu	. Ala 845		Lys	Ala
_	850				Ala	855	Phe	Asp			860				
865					Pro 870					875					880
Ser	Gly			885					890					895	
Val	Pro	Arg	Leu 900		Ser	Met	Glu	Glu 905		Ala	Leu	Ala	Ile 910	Asp	Arg

Pro Ala Ser Ser Val His Cys His Ala Tyr Ala Ala Thr Asp Ala Ser 920 91.5 Lys Val Ser Ile Thr Glu His Tyr Leu 935 <210> 74 <211> 808 <212> PRT <213> Lolium perenne <400> 74 Met Ala Ala Lys Leu Thr Arg Leu His Ser Leu Arg Glu Arg Leu Gly 1 5 10 Ala Thr Phe Ser Ser His Pro Asn Glu Leu Ile Ala Leu Phe Ser Lys 25 20 Tyr Val His Gln Gly Lys Gly Met Leu Gln Arg His Gln Leu Leu Thr 40 Glu Phe Glu Ala Leu Phe Glu Ala Asp Lys Glu Arg Tyr Ala Pro Phe 60 50 55 Glu Asp Ile Leu Arg Ala Ala Gln Glu Ala Ile Val Leu Pro Pro Trp 65 70 75 80 Val Ala Leu Ala Ile Arg Pro Arg Pro Gly Val Trp Asp Tyr Ile Arg 90 85 Val Asn Val Ser Glu Leu Ala Val Glu Glu Leu Thr Val Ser Glu Tyr . 100 105 Leu Ala Phe Lys Glu Gln Leu Val Asp Glu His Ala Ser Ser Lys Phe 125 115 120 Val Leu Glu Leu Asp Phe Glu Pro Phe Asn Ala Ser Phe Pro Arg Pro 130 135 140 Ser Met Ser Lys Ser Ile Gly Asn Gly Val Gln Phe Leu Asn Arg His 145 150 155 Leu Ser Ser Lys Leu Phe Gln Asp Lys Glu Ser Leu Tyr Pro Leu Leu 165 170 175 Asn Phe Leu Lys Ala His Asn His Gln Gly Thr Thr Met Met Leu Asn 180 185 190 Asp Arg Ile Gln Ser Leu Arg Gly Leu Gln Ser Ala Leu Arg Lys Ala 205 200 195 Glu Glu Tyr Leu Thr Ser Ile Pro Glu Asp Thr Pro Ser Ser Glu Phe 210 215 220 Asn His Arg Phe Gln Glu Leu Gly Leu Glu Lys Gly Trp Gly Asp Thr 225 230 235 Ala Lys Arg Val Gln Asp Thr Ile His Leu Leu Leu Asp Leu Leu Glu 245 250 Ala Pro Asp Pro Ala Ser Leu Glu Lys Phe Leu Gly Thr Ile Pro Met 270 265 Met Phe Asn Val Val Ile Leu Ser Pro His Gly Tyr Phe Ala Gln Ser 285 280 275 Asn Val Leu Gly Tyr Pro Asp Thr Gly Gly Gln Val Val Tyr Ile Leu 300 290 295 Asp Gln Val Arg Ala Leu Glu Asn Glu Met Leu Leu Arg Ile Lys Gln 310 315 Gln Gly Leu Asp Ile Thr Pro Lys Ile Leu Ile Val Thr Arg Leu Leu 325 330 335 Pro Asp Ala Val Gly Thr Thr Cys Gly Gln Arg Leu Glu Lys Val Ile 345 350 Gly Thr Glu His Thr Asp Ile Leu Arg Val Pro Phe Arg Thr Glu Lys 355 360 365 Gly Ile Leu Arg Lys Trp Ile Ser Arg Phe Asp Val Trp Pro Tyr Leu 370 375 380 Glu Thr Tyr Thr Glu Asp Val Ala Asn Glu Leu Met Arg Glu Met Gln 390 395 Thr Lys Pro Asp Leu Ile Ile Gly Asn Tyr Ser Asp Gly Asn Leu Val 405 410 415 Ala Thr Leu Leu Ala His Lys Leu Gly Val Thr Gln Cys Thr Ile Ala 425

PCT/NZ02/00239

```
His Ala Leu Glu Lys Thr Lys Tyr Pro Asn Ser Asp Ile Tyr Leu Asp
                     440
Lys Phe Asp Ser Gln Tyr His Phe Ser Cys Gln Phe Thr Ala Asp Leu
                  455
                               460
Ile Ala Met Asn His Thr Asp Phe Ile Ile Thr Ser Thr Phe Gln Glu
                               475
             470
Ile Ala Gly Ser Lys Asp Ser Val Gly Gln Tyr Glu Ser His Ile Ala
    485
                           490
Phe Thr Leu Pro Asp Leu Tyr Arg Val Val His Gly Ile Asp Val Phe
     500 505 510
Asp Pro Lys Phe Asn Ile Val Ser Pro Gly Ala Asp Met Thr Val Tyr
                     520 525
Phe Pro Tyr Thr Glu Thr Asp Lys Arg Leu Thr Ala Phe His Pro Glu
                535
                          540
Ile Glu Glu Leu Leu Tyr Ser Asp Val Glu Asn Ser Glu His Lys Phe
545 550
                              555
Val Leu Lys Asp Lys Asn Lys Pro Ile Ile Phe Ser Met Ala Arg Leu
         565 570 575
Asp Arg Val Lys Asn Met Thr Gly Leu Val Glu Met Phe Gly Lys Asn
        580 585 590
Ala His Leu Lys Asp Leu Ala Asn Leu Val Ile Val Ala Gly Asp His
          600
                                     605
Gly Lys Glu Ser Lys Asp Arg Glu Glu Gln Ala Glu Phe Lys Arg Met
 610 615
Tyr Ser Leu Ile Glu Glu Tyr Lys Leu Glu Gly His Ile Arg Trp Ile
625 630 635
Ser Ala Gln Met Asn Arg Val Arg Asn Ala Glu Leu Tyr Arg Tyr Ile
            645 650 655
Cys Asp Thr Lys Gly Ala Phe Val Gln Pro Ala Phe Tyr Glu Ala Phe
       660 665 670
Gly Leu Thr Val Val Glu Ala Met Thr Cys Gly Leu Pro Thr Ile Ala
 675 680
                                  685
Thr Cys His Gly Gly Pro Ala Glu Ile Ile Val Asn Gly Val Ser Gly
 690 695
Leu His Ile Asp Pro Tyr His Ser Asp Lys Ala Ala Asp Ile Leu Val
                              715
               710
Asn Phe Phe Glu Lys Ser Thr Ala Asp Pro Thr Tyr Trp Asp Lys Met
                   730 735
            725
Ser Glu Gly Gly Leu Lys Arg Ile Tyr Glu Lys Tyr Thr Trp Lys Leu
        740 745
                                750
Tyr Ser Glu Arg Leu Met Thr Leu Thr Gly Val Tyr Gly Phe Trp Lys
 755 760
                                     765
Tyr Val Ser Asn Leu Glu Arg Arg Glu Thr Arg Arg Tyr Leu Glu Met
 770 775 780
Phe Tyr Ala Leu Lys Tyr Arg Ser Leu Ala Ala Val Pro Leu Ala
               790 795 800
Val Asp Gly Glu Asn Thr Asp Asn
<210> 75
<211> 808
<212> PRT
<213> Festuca arundinacea
Met Ala Ala Lys Leu Thr Arg Leu His Ser Leu Arg Glu Arg Leu Gly
                            10
             5
Ala Thr Phe Ser Ser His Pro Asn Glu Leu Ile Ala Leu Phe Ser Lys
         20
                         2.5
Tyr Val His Gln Gly Lys Gly Met Leu Gln Arg His Gln Leu Leu Thr
                     40
Glu Phe Glu Ala Leu Phe Glu Ser Asp Lys Glu Arg Tyr Ala Pro Phe
          55
                               60
Gln Asp Ile Leu Arg Ala Ala Gln Glu Ala Ile Val Leu Pro Pro Trp
```

Val	Ala	Leu	Ala	Ile 85	Arg	Pro	Arg	Pro	Gly 90	Val	Trp	Asp	Tyr	Ile 95	Arg
Val	Asn	Val	Ser 100	Glu	Leu	Ala	Val	Glu 105	Glu	Leu	Thr	Val	Ser 110	Glu	Tyr
Leu	Ala	Phe 115	Lys	Glu	Gln	Leu	Val 120		Glu	His	Ala	Ser 125	Ser	Lys	Phe
Val	Leu 130	Glu	Leu	Asp	Phe'	Glu 135	Pro	Phe	Asn	Ala	Ser 140	Phe	Pro	Arg	Pro
Ser 145	Met	Ser	Lys	Ser	Ile 150	Gly	Asn	Gly	Val	Gln 155	Phe	Leu	Asn	Arg	His 160
			Lys	165		~			170					175	
			Lys 180					185					190		
_	_	195	Thr				200					205			
	210	-	Leu			215					220				
225			Phe		230					235					240
	_	_	Val	245					250					255	
			Pro 260					265					270		
		275	Val				280					285			
	290		Gly Arg			295					300				
305					310					315					320
			Asp	325					330					335	
			Val 340					345					350		
_		355	His				360					365			
_	370		Arg	-		375					380				
385			Thr		390					395					400
			Asp	405					410					415	
			Leu 420					425					430		
		435	Glu	_		_	440					445			
	450		Ser			455					460				
465			Asn		470					475					480
			. Ser	485					490					495	
Phe	Thr	Leu	Pro 500	Asp	Leu	Tyr	Arg	Val 505		His	Gly	Ile	Asp 510	Val	Phe
_		515					520		•			525			
	530		Thr			535					540				
545			Leu		550					555					560
			Asp	565				•	570					575	
			Lys 580					585					590		
Ala	His	Leu 595	Lys	Asp	Leu	Ala	Asn 600		Val	Ile	Val	Ala 605		Asp	His

Gly Lys Glu Ser Lys Asp Arg Glu Glu Gln Ala Glu Phe Lys Arg Met 620 615 Tyr Ser Leu Ile Glu Glu Tyr Lys Leu Lys Gly His Ile Arg Trp Ile 630 635 Ser Ala Gln Met Asn Arg Val Arg Asn Ala Glu Leu Tyr Arg Tyr Ile 650 655 645 Cys Asp Thr Lys Gly Ala Phe Val Gln Pro Ala Phe Tyr Glu Ala Phe 660 665 670 Gly Leu Thr Val Ile Glu Ala Met Thr Cys Gly Leu Pro Thr Ile Ala 675 680 685 Thr Cys His Gly Gly Pro Ala Glu Ile Ile Val Asp Gly Val Ser Gly 700 690 695 Leu His Ile Asp Pro Tyr His Ser Asp Lys Ala Ala Asp Ile Leu Val 710 715 Asn Phe Phe Glu Lys Ser Thr Ala Asp Pro Thr Tyr Trp Asp Lys Met 735 725 730 Ser Glu Gly Gly Leu Lys Arg Ile Tyr Glu Lys Tyr Thr Trp Lys Leu 740 745 750 Tyr Ser Glu Arg Leu Met Thr Leu Thr Gly Val Tyr Gly Phe Trp Lys 755 760 765 Tyr Val Ser Asn Leu Glu Arg Arg Glu Thr Arg Arg Tyr Leu Glu Met 780 775 Phe Tyr Ala Leu Lys Tyr Arg Ser Leu Ala Ala Ala Val Pro Leu Ala 785 790 795 Val Asp Gly Glu Asn Thr Asp Ser

<210> 76 <211> 814 <212> PRT

<213> Lolium perenne

805 .

245

<400> 76 Met Gly Glu Ala Ala Gly Asp Arg Val Leu Ser Arg Leu His Ser Val 10 Arg Glu Arg Ile Gly Asp Ser Leu Ser Ala His Pro Asn Glu Leu Val 20 25 Ala Val Phe Thr Arg Leu Val Asn Leu Gly Lys Gly Met Leu Gln Pro 40 45 35 His Gln Ile Ile Ala Glu Tyr Asn Thr Ala Ile Pro Glu Ala Glu Arg 55 60 Glu Lys Leu Lys Asp Gly Ala Phe Glu Asp Val Leu Arg Ala Ala Gln 65 70 75 80 Glu Ala Ile Val Ile Ser Pro Trp Val Ala Leu Ala Ile Arg Pro Arg 90 Pro Gly Val Trp Glu Tyr Val Arg Val Asn Val Ser Glu Leu Ala Val 100 105 Glu Glu Leu Ser Val Pro Glu Tyr Leu Gln Phe Lys Glu Gln Leu Val 115 120 125 Glu Gly Ser Asn Lys Asp Phe Val Leu Glu Leu Asp Phe Glu Pro Phe 130 135 140 Asn Ala Ser Phe Pro Arg Pro Ser Leu Ser Lys Ser Ile Gly Asn Gly 150 155 Val Gln Phe Leu Asn Arg His Leu Ser Ser Lys Leu Phe His Asp Lys 165 170 Glu Ser Met Tyr Pro Leu Leu Asn Phe Leu Arg Ala His Asn Tyr Lys 180 185 190 Gly Met Pro Met Met Met Asn Asp Arg Val Arg Ser Leu Ser Ala Leu 205 195 200 Gln Gly Ala Leu Arg Lys Ala Glu Glu His Leu Ser Gly Leu Pro Ala 210 215 220 Asp Thr Pro Tyr Ser Asp Phe His His Arg Phe Gln Glu Leu Gly Leu 225 230 235 240 Glu Lys Gly Trp Gly Asp Cys Ala Lys Arg Ala Gln Glu Thr Leu His

Leu Leu Asp Leu Leu Glu Ala Pro Asp Pro Ser Thr Leu Glu Lys 260 265 Phe Leu Gly Thr Ile Pro Met Val Phe Asn Val Val Ile Leu Ser Pro 280 285 .His Gly Tyr Phe Ala Gln Ala Asn Val Leu Gly Tyr Pro Asp Thr Gly 300 295 Gly Gln Val Val Tyr Ile Leu Asp Gln Val Arg Ala Met Glu Asn Glu 305 310 315 320 Met Leu Leu Arg Ile Lys Gln Gln Gly Leu Asp Ile Thr Pro Arg Ile 325 330 335 Leu Ile Val Thr Arg Leu Leu Pro Asp Ala Thr Gly Thr Thr Cys Gly 340 345 350345 Gln Arg Leu Glu Lys Val Leu Gly Thr Glu His Thr His Ile Leu Arg 355 360 Val Pro Phe Arg Thr Glu Asn Gly Ile Val Arg Lys Trp Ile Ser Arg 370 375 380 Phe Glu Val Trp Pro Tyr Leu Glu Thr Phe Thr Asp Asp Val Ala His 385 390 395 Glu Ile Ser Gly Glu Leu Gln Ala Asn Pro Asp Leu Ile Ile Gly Asn 405 410 415 Tyr Ser Asp Gly Asn Leu Val Ala Cys Leu Leu Ala His Lys Met Gly 420 425 430 Val Thr His Cys Thr Ile Ala His Ala Leu Glu Lys Thr Lys Tyr Pro 435 440 Asn Ser Asp Leu Tyr Trp Lys Lys Phe Glu Asp His Tyr His Phe Ser 450 455 460 Cys Gln Phe Thr Thr Asp Leu Ile Ala Met Asn His Ala Asp Phe Ile 475 480 470 Ile Thr Ser Thr Phe Gln Glu Ile Ala Gly Asn Lys Asp Thr Val Gly 485 490 495 Gln Tyr Glu Ser His Met Ala Phe Thr Met Pro Gly Met Tyr Arg Val 500 505 510 Val His Gly Ile Asp Val Phe Asp Pro Lys Phe Asn Ile Val Ser Pro 515 520 525 Gly Ala Asp Met Ser Ile Tyr Phe Pro Tyr Ser Glu Ser Gln Arg Arg 530 535 540 Leu Thr Ser Leu His Pro Glu Ile Glu Glu Leu Leu Tyr Ser Asp Val 550 555 Asp Asn Asp Glu His Ser Cys Leu Lys Asp Arg Asn Lys Pro Ile Ile 565 570 575 Phe Ser Met Ala Arg Leu Asp Arg Val Lys Asn Leu Thr Gly Leu Val 580 585 590 Glu Leu Tyr Gly Arg Asn Pro Arg Leu Gln Glu Leu Val Asn Leu Val 595 600 605 Val Val Cys Gly Asp His Gly Asn Pro Ser Lys Asp Lys Glu Glu Gln 615 620 Ala Glu Phe Lys Lys Met Phe Asp Leu Ile Glu Gln Tyr Asn Leu Asn 635 630 Gly His Ile Arg Trp Ile Ser Ala Gln Met Asn Arg Val Arg Asn Ala 645 650 655 Glu Leu Tyr Arg Tyr Ile Cys Asp Thr Lys Gly Ala Phe Val Gln Pro 660 665 670 Ala Phe Tyr Glu Ala Phe Gly Leu Thr Val Ile Glu Ala Met Thr Cys 675 680 Gly Leu Pro Thr Phe Ala Thr Ala Tyr Gly Gly Pro Ala Glu Ile Ile 695 700 Val Asn Gly Val Ser Gly Tyr His Ile Asp Pro Tyr Gln Gly Asp Lys 710 715 Ala Ser Ala Leu Leu Val Glu Phe Phe Glu Lys Cys Gln Gly Asp His 725 730 735 Ser His Trp Thr Lys Ile Ser Leu Gly Gly Leu Gln Arg Ile Glu Glu 740 745 Lys Tyr Thr Trp Lys Leu Tyr Ser Glu Arg Leu Met Thr Leu Thr Gly 755 760 765 Val Tyr Gly Phe Trp Lys Tyr Val Ser Asn Leu Glu Arg Arg Glu Thr 775

Arg Arg Tyr Leu Glu Met Leu Tyr Ala Leu Lys Tyr Arg Thr Met Ala 795 790 Ser Thr Val Pro Leu Ala Val Glu Gly Glu Pro Ser Ser Lys 805

<210> 77 <211> 816

<212> PRT

<213> Festuca arundinacea

420

<400> 77 Met Gly Glu Ser Ala Gly Glu Arg Ala Leu Ser Arg Leu His Ser Val 10 Arg Glu Arg Ile Gly Asp Ser Leu Ser Ala His Thr Asn Glu Leu Val 25 Ala Val Phe Ser Arg Leu Val Asn His Gly Lys Gly Met Leu Gln Pro 40 His Gln Ile Thr Ala Glu Tyr Asn Ala Ala Ile Pro Glu Ala Glu Arg 50 55 Glu Lys Leu Lys Asp Thr Ala Phe Glu Asp Leu Leu Arg Gly Ala Gln 70 7.5 Glu Ala Ile Val Ile Pro Pro Trp Val Ala Leu Ala Ile Arg Pro Arg 85 90 Pro Gly Val Trp Glu Tyr Val Arg Val Asn Val Ser Glu Leu Gly Val 105 110 Glu Glu Leu Ser Val Pro Glu Tyr Leu Gln Phe Lys Glu Gln Leu Val 125 120 115 Asn Glu Ser Thr Asp Asn Asn Phe Val Leu Glu Leu Asp Phe Gly Pro 130 135 140 Phe Asn Ala Ser Phe Pro Arg Pro Ser Leu Ser Lys Ser Ile Gly Asn 145 150 155 Gly Val Gln Phe Leu Asn Arg His Leu Ser Ser Lys Leu Phe His Asp 165 170 175 Lys Glu Ser Met Tyr Pro Leu Leu Asn Phe Leu Arg Ala His Asn Tyr 180 185 190 Lys Gly Met Thr Met Met Leu Asn Asp Arg Ile Arg Ser Leu Ser Ala 195 200 205 Leu Gln Asp Ala Leu Arg Lys Ala Glu Lys His Leu Ser Gly Leu Pro 215 220 Ala Asp Thr Pro Tyr Ser Glu Phe His His Arg Phe Gln Glu Leu Gly 225 230 235 240 Leu Glu Lys Gly Trp Gly Asp Cys Thr Gln Arg Ala His Glu Thr Ile 245 250 255 His Leu Leu Asp Leu Leu Glu Ala Pro Asp Pro Ser Thr Leu Glu 265 270 260 Lys Phe Leu Gly Thr Ile Pro Met Val Phe Asn Val Val Ile Leu Ser 285 275 280 Pro His Gly Tyr Phe Ala Gln Ala Asn Val Leu Gly Tyr Pro Asp Thr 295 300 Gly Gly Gln Val Val Tyr Ile Leu Asp Gln Val Arg Ala Met Glu Asn 305 310 315 Glu Met Leu Leu Arg Ile Lys Gln Gln Gly Leu Asp Ile Thr Pro Lys 325 330 335 Ile Leu Ile Val Thr Arg Leu Leu Pro Asp Ala His Gly Thr Thr Cys 350 340 345 Gly Gln Arg Leu Glu Lys Val Leu Gly Thr Glu His Thr His Ile Leu 360 Arg Val Pro Phe Lys Thr Glu Asp Gly Ile Val Arg Lys Trp Ile Ser 380 375 Arg Phe Glu Val Trp Pro Tyr Leu Glu Ala Tyr Thr Asp Asp Val Ala 385 390 395 His Glu Ile Ala Gly Glu Leu Gln Ala Asn Pro Asp Leu Ile Ile Gly 405 410 415 Asn Tyr Ser Asp Gly Asn Leu Val Ala Cys Leu Leu Ala His Lys Leu

									_			_		_	_
		435					Ala 440					445			
	450					455	Lys				460				
Ser 465	Cys	Gln	Phe	Thr	Ala 470	Asp	Leu	Ile	Ala	Met 475	Asn	His	Ala	Asp	Phe 480
	Ile	Thr	Ser	Thr 485	Phe	Gln	Glu	Ile	Ala 490	Gly	Asn	Lys	Asp	Thr 495	Val
Gly	Gln	Tyr	Glu 500	Ser	His	Met	Ala	Phe 505	Thr	Met	Pro	Gly	Leu 510	Туг	Arg
Val	Val	His 515		Ile	Asp	Val	Phe 520		Pro	Lys	Phe	Asn 525	Ile	Val	Ser
Pro	Gly 530		Asp	Met	Thr	Ile 535	Tyr	Phe	Pro	Tyr	Thr 540	Glu	Gln	Gln	Lys
Arg 545	Leu	Thr	Ser	Leu	His 550		Glu	Ile	Glu	Glu 555		Leu	Phe	Ser	Asp 560
	Glu	Asn		Glu 565		Lys	Phe	Val	Leu 570		Asp	Lys	Asn	Lys 575	Pro
Ile	Ile	Phe			Ala	Arg	Leu	Asp 585		Val	Lys	Asn	Met 590	Thr	Gly
Leu	Val	Glu 595		Tyr	Gly	Arg	Asn 600		Arg	Leu	Gln	Glu 605	Leu	Val	Asn
Leu	Val 610		Val	Cys	Gly	Asp 615	His	Gly	Lys	Glu	Ser 620	Lys	Asp	Lys	Glu
Glu 625		Ala	Glu	Phe	Lys 630		Met	Phe	Asp	Leu 635		Glu	Gln	Tyr	Asn 640
Leu	Ser	Ser	His	Ile 645		Trp	Ile	Ser	Ala 650		Met	Asn	Arg	Val 655	Arg
Asn	Gly	Glu	Leu 660		Arg	Tyr	Ile	Cys 665		Met	Lys	Gly	Ala 670	Phe	Val
Gln	Pro	Ala 675		Tyr	Glu	Ala	Phe 680	Gly	Leu	Thr	Val	Ile 685		Ala	Met
Thr	Cys 690	Gly	Leu	Pro	Thr	Phe 695	Ala		Ala	Tyr	Gly 700		Pro	Ala	Glu
Ile 705		Val	Asn	Gly	Val 710		Gly	Tyr	His	Ile 715		Pro	Tyr	Gln	Asn 720
Asp	Lys	Ala	Ser	Ala 725		Leu	Val	Glu	Phe 730	Phe	Glu	Lys	Cys	Gln 735	Glu
Asp	Pro	Ser	His 740	Trp	Asn	Lys	Ile	Ser 745	Gln		Gly	Leu	Gln 750	Arg	Ile
Glu	Glu	Lys 755			Trp	Lys	Leu 760	Tyr		Glu	Arg	Leu 765	Met	Thr	Leu
Ser	Gly 770	Val	Tyr	Gly	Phe	Trp 775	Lys		Val	Ser	Asn 780	Leu	Asp	Arg	Arg
Glu 785	Thr		Arg	Tyr	Leu 790	Glu	. Met	Leu	Tyr	Ala 795	Leu	Lys	Tyr	Arg	Lys 800
Met	Ala	Thr	Thr	Val 805	Pro		. Ala	Ile	Glu 810	Gly		Thr	Thr	Gly 815	Lys
				000	v				020						
	0> 7														
	1> 4 2> P														
			.ca a	rund	inac	ea									
<40	0>_7	8	_	~ ·		70 T -	- 1-	G.T.		71	mb	Dro	C1 11	7.50	Tle
1				5			ı Ile		10					15	
			20				Ala	25					30		
Val	. Ile	Met 35	Tyr	Thr	. GTĀ	. GTZ	Asp 40	val	. Glu	. Asn	. HlS	45	. val	GII	Asn
Ile	Ala 50		Pro	Lys	Asn	Arg 55	g Ser	: Asp	Pro	туг	Leu 60	Ile	Glu	Trp	Thr
Lys 65		Cys	Asn	Asn	Pro	Val	Leu	ı Glr	n Pro	Val 75	. Gly	Pro	Gly	Met	Asn 80
•															

```
Pro Gly Glu Phe Arg Asp Pro Thr Thr Gly Trp Ile Gly Pro Asp Gly
                           90
          8.5
Leu Trp Arg Ile Ser Ile Gly Ala Glu Val Asn Gly Tyr Ser Ala Ala
                      105
Leu Leu Tyr Lys Ser Glu Asp Phe Leu Asn Trp Ser Arg Val Asp His
                                     125
115 120
Pro Leu Tyr Ser Ser Ser Ala Ser Thr Met Trp Glu Cys Leu Asp Phe
 130 135 140
Phe Ala Val Leu Pro Gly Ser Asn Gly Gly Leu Asp Leu Ser Ala Ala
145 150 155
Ile Pro Lys Gly Ala Lys His Val Leu Lys Val Ser Val Asp Gln Cys 165 170 175
Asp Lys Tyr Met Ile Gly Val Tyr Asp Leu Glu His Asp Ala Phe Val
                       185 190
Pro Asp Thr Ile Leu Asp Asp Arg Trp Leu Leu Pro Arg Ile Asp Tyr
                                     205
 195 200
Gly Asn Tyr Tyr Ala Ser Lys Ser Phe Phe Asp Ser Lys Asn Arg Arg
          215
                         220
  210
Arg Ile Ile Trp Gly Trp Thr Asn Glu Ser Asp Ser Ser Ser Asp Asp 225 230 235 240
Val Ala Lys Gly Trp Ala Gly Ile Tyr Ala Ile Pro Arg Thr Ile Trp
245 250 255
Leu Asp Arg Asp Gly Lys Gln Leu Leu Gln Trp Pro Val Glu Glu Ile
                       265 270
Glu Ser Leu Arg Arg Asn Glu Ile Asn Tyr Gln Gly Leu Asp Leu Glu
                     280
Lys Gly Asp Leu Tyr Glu Ile Lys Gly Val Asp Thr Leu Gln Ala Asp
                         300
  290 295
Val Glu Ile Asp Phe Glu Leu Thr Ser Ile Asp Asp Ala Asp Ser Phe
305 310 315 320
Asp Pro Ser Trp Leu Leu Asp Pro Glu Lys His Cys Arg Glu Ala Gly
           325 330 335
Ala Ser Val His Gly Gly Ile Gly Pro Phe Gly Leu Val Ile Leu Ala
    340
                         345
Thr Gly Asp Met Glu Glu His Thr Val Val His Phe Arg Val Tyr Lys
     355 360 365
Ser Gln Lys Glu Tyr Met Ile Leu Met Cys Ser Asp Ile Arg Arg Ser
                  375
                       380
Ser Leu Arg Gln Gly Leu Tyr Ala Pro Ala Tyr Gly Gly Phe Phe Glu
385 390 395 400
Phe Asp Leu Glu Lys Glu Arg Lys Ile Ser Leu Arg Thr Leu Ile Asp 405 410 415
Arg Ser Ala Val Glu Ser Phe Gly Gly Gly Gly Arg Val Cys Ile Ile
       420 425 430
Ala Arg Val Tyr Pro Val Ala Ile Val Asp Asp Gly Ser Ala His Met
     435 440 445
Tyr Ala Phe Asn Asn Gly Ser Thr Thr Val Arg Val Pro Gln Ile Arg
                  455
                                   460
Ala Trp Ser Met Met Thr Ala Gln Val Asn Leu Lys Lys Gly
465 470
<210> 79
<211> 583
<212> PRT
<213> Lolium perenne
<400> 79
```

Met Gly Asn Pro Lys Trp Val Leu Ala Pro Trp Ala Val Leu Leu Leu 1 1 5 10 15

Leu Gln Leu Ala Ser Ala Ser His His Ala Arg Leu Ser Leu Glu Thr 20 25 30

Ser Ala Ala Ser Pro Ser Val Pro Ala Ser Ile Val Ser Pro Leu Leu 35 40 45

Arg Thr Gly Tyr His Phe Gln Pro Pro Met Asn Trp Ile Asn Asp Pro

	Gly	Pro	Leu	Tyr	Tyr	Lys	Gly	Trp	Tyr	Hìs 75	Leu	Phe	Tyr	Gln	Tyr 80
65 Asn	Pro	Lys	Gly		70 Val	Trp	Gly	Asn	Ile 90		Trp	Ala	His	Ser 95	-
Ser	Arg	Asp	Leu 100	85 Ile	Asn	Trp	Ile	Ala 105		Glu	Pro	Ala	Ile 110		Pro
Thr	Ile	Pro		Asp	Gln	Туг	Gly 120		Trp	Ser	Gly	Ser 125		Thr	Ile
Leu	His 130		Gly	Thr	Pro	Ala 135		Leu	Tyr	Thr	Gly 140	Ile	Asp	Arg	Pro
145	Val				Ile 150					155					160
Asp				165	Glu				170					175	
			180		Ile			185					190		
		195			Arg		200					205			
	210				Gly	215					220				
225					Ala 230					235					240
				245	Asp				250					255	
_			260		Ser			265					270		
		275			Ser		280					285			
	290				Asn	295					300				
305					Gln 310					315					320
				325	Phe				330					335	
			340		Ser			345					350		
_		355			Ala		360					365			
	370				Gln	375					380				
385					Val 390					395					400
				405					410					415	
			420		Leu			425					430		
		435			Lys		440					445			
-	450				Phe	455					460				
465					Val 470					475					480
-				485					490					495	
			500		Pro			505					510		
Ser	Ser	Gly 515		Ile	Ser	Leu	Arg 520		Leu	Ile	Asp	Arg 525	Ser	Val	Val
	530	1			СļУ	535	ı				540				
545	Ser	Met			Gly 550					555					560
Gly	Glu			565				Lys	Leu 570		Ala	Trp	Glu	Met 575	Lys
Arg	Pro	Let	Met 580		Gly	Ala	l								

<210> 80 <211> 390 <212> PRT

```
<213> Lolium perenne
Gly Val Gly Ser Leu Leu Val Tyr Arg Ser Ala Asp Phe Leu Arg Trp
                            10
Gln Arg Asn Ala Ala Pro Leu His Ala Ser Ser Arg Asp Val Pro Val
 20
                       25
Leu Glu Cys Pro Asp Leu Phe Pro Val Ala Ala Ala Gln Gly Ala
35 40
Thr Glu Gly Leu Glu Thr Ser Ala Pro Ser Gly Ala Gly Val Arg His
                                   60
 50 55
Val Leu Lys Leu Thr Asp Phe Ala Lys Glu Asp His Tyr Met Val Gly
                70
                                75
Phe Tyr Asp Asp Val Ala Asp Thr Phe Val Pro Ala Glu Pro Glu Arg
                 90
          85
Gly Asp Asp Pro Asp Asn Trp Arg Arg Leu Asp His Gly His Leu Tyr
   100 105
Ala Ser Lys Ser Phe Tyr Asp Ala Arg Asn Lys Arg Arg Ile Leu Trp
 115 120 125
Ala Trp Val Asp Glu Thr Asp Gly Gly Gly Val Ala Arg Gly Trp Ala
                  135
                          140
Gly Ile Gln Ala Phe Pro Arg Ala Met Trp Leu Asp Ala Asp Gly Lys
             150
                                155
Arg Leu Val Gln Trp Pro Val Glu Glu Ile Glu Thr Leu Arg Arg Lys
       165 170 175
Arg Val Gly Leu Arg Trp Ala Thr Asp Val Glu Ala Gly Gly Arg Lys
         180 185 190
Glu Ile Ala Gly Ile Val Ser Ser Gln Ala Asp Val Glu Val Val Phe
             200
                             205
Glu Ile Pro Asn Leu Glu Glu Ala Glu Thr Leu Asp Pro Glu Trp Val
                 215
                                   220
Leu Asp Pro Lys Gly Leu Cys Ala Ala Lys Gly Ala Ser Val His Gly
                              235
               230
Gly Val Gly Pro Phe Gly Leu Leu Val Leu Ala Ser Gly Asp Leu Glu
         245 250
Glu His Thr Ala Val Phe Phe Arg Val Phe Lys His Asp Gly Lys Tyr
       260 265 270
Lys Val Leu Met Cys Thr Asp Leu Thr Lys Ser Ser Thr Lys Ala Gly 275 280 285
Ala His Lys Pro Ser Tyr Gly Ala Phe Leu Asp Val Asp Val Glu Lys
                                  300
                  295
Asp Lys Phe Ile Ser Leu Arg Thr Leu Ile Asp His Thr Val Val Glu
305 310
                               315
Ser Phe Gly Asp Gly Gly Arg Thr Cys Met Thr Ala Arg Val Tyr Pro 325 330 335
Glu His Ala Ala Met Gly Ser Thr His Leu Tyr Val Phe Asn Asn Gly 340 345 350
Thr Gly Ala Val Lys Val Ser Lys Leu Glu Ala Trp Glu Leu Ala Thr
355 360 365
Ala Ala Val Asn Gly Gly Ser Leu Ala Pro Val Val Val Lys Ala Ser
 370 375
Asp Pro Lys Glu Ala Leu
385
<210> 81
<211> 597
<212> PRT
<213> Festuca arundinacea
Met Ala Gly Leu Arg Leu Ala Ala Cys Ala Ala Val Ala Val Leu Leu
```

Cys	Leu	Leu	Leu 20	Ser	Ser	Ser	Ala	Ala 25	Leu	Arg	Trp	Leu	Ser 30	Asp	Pro
Ala	Pro	Glu 35	Ser	Ala	Ala	Ala	Gly 40	Val	Ser	His	Asp	Ser 45	Tyr	Arg	Thr
	50	His	Phe			55					60				
65			Tyr		70					75					80
			Thr	85					90					95	
			Leu 100					105					110		
-		115	Phe				120					125			
	130		Gly			135					140				
145			Val		150					155					160
			Glu	165					170					175	
			Val 180					185					190		
		195	Asp				200					205			
	210		Gly Asn			215					220				
225			Pro		230					235					240
			Tyr	245					250					255	
			260 Val					265					270		
		275	Val				280					285			
	290		Trp			295					300				
305			Asp		310					315					320
			Asp	325					330					335	
			340 Val					345					350		
		355					360					365			
	370		Leu			375					380	1			
385			Ala		390					395	i				400
			Glu	405					410)			Leu	415 Leu	
Pro	Gln	Arg	420 Leu	Cys	Gly	Glu	ı Lys	425 Gly		a Ser	. Val	. Let	430 Gly		Val
Gly	Pro	435 Phe	Gly	Leu	Leu	. Val	440 Leu		sei	Gl ₂	Asp	445 Leu		Glu	His
Thr	450 Ser	· Val	Phe	Phe				a Arç	, His	s Glu	460 Glz		гуг	Lys	Val
465 Leu	Met	. Cys	Thr			Arg	g Arc	sei	Thi	475 Thi		g Ala	Asp	Val	480 Tyr
Lys	Pro	Pro	Tyr		Gly	Phe	e Val) Ile	e Glu	Lys	495 Glu	
Ser	Ile		500 Leu		Thr	Lev				s Sei	. Val	L Val	510 Glu		Tyr
Gly			Gly	' Arg	Thr				Ala	a Arç	y Val 540	L Tyı		Glu	His
	530	,				535	,				24(•			

<210> 82

<211> 399

<212> PRT

<213> Festuca arundinacea

<400> 82 Leu Asn Ser Thr Glu Phe Arg Asp Pro Thr Thr Gly Trp Ile Gly Pro 5 10 Asp Gly Leu Trp Arg Ile Ala Ile Gly Ala Glu Leu Asn Gly Tyr Gly 25 Ala Ala Leu Leu Tyr Lys Ser Glu Asp Phe Leu Asn Trp Thr Arg Val 35 40 Asp His Pro Leu Tyr Ser Asp Asn Ala Pro Ser Met Trp Glu Cys Pro 55 60 Asp Phe Phe Ala Val Leu Pro Gly Asn Asn Gly Gly Leu Asp Leu Ser 75 70 Ala Ala Ile Pro Lys Gly Ala Lys His Val Leu Lys Met Ser Val Asp 90 Tyr Ser Asp Lys Tyr Met Ile Gly Val Tyr Asp Leu Lys Arg Asp Ala 105 110 100 Phe Val Pro Asp Val Val Leu Asp Asp Arg Arg Leu Trp Leu Arg Ile 115 120 125 Asp Tyr Gly Thr Phe Tyr Ala Ser Lys Ser Phe Phe Asp Ser Lys Arg 130 135 140 Gly Arg Arg Val Ile Trp Gly Trp Ser Asn Glu Thr Asp Ser Val Ser 150 155 160 Asp Asp Gly Ala Lys Gly Trp Ala Gly Ile His Ala Ile Pro Arg Ser 1.75 170 165 Ile Trp Leu Asp Ser Asp Gly Lys Gln Leu Leu Gln Trp Pro Ile Asp 180 185 190 Glu Ile Glu Ser Leu Arg Arg Asp Glu Ile Asn His Gln Gly Leu Glu 195 200 205 Leu Lys Asn Gly Asp Leu Phe Glu Ile Lys Gly Ile Asp Thr Leu Gln 220 215 Ala Asp Ile Glu Val Asp Phe Glu Leu Thr Ser Ile Asp Ser Ala Asp 230 235 Pro Phe Asp Pro Ser Trp Leu Leu Asp Val Glu Arg His Cys Arg Glu 250 255 245 Ala Gly Ala Ser Val Gln Gly Gly Ile Gly Pro Phe Gly Leu Val Val 265 260 Leu Ala Ser Asp Asn Met Glu Glu His Ile Ala Val His Phe Arg Val 275 280 285 Tyr Lys Ser Gln Lys Ser His Met Ile Leu Met Cys Ser Asp Leu Arg 300 295 Arg Ser Ser Leu Arg Ser Gly Leu Tyr Thr Pro Ala Tyr Gly Gly Phe 315 305 310 Phe Glu Phe Asp Leu Glu Lys Glu Arg Lys Ile Ser Leu Arg Thr Leu 330 325 Ile Asp Arg Ser Ala Val Glu Ser Phe Gly Gly Gly Arg Val Cys 345 340 Ile Thr Ala Arg Ile Tyr Pro Val Ala Leu Val Asp Gly Arg Val His 355 360 365 Met Tyr Ala Phe Asn Asn Gly Ser Thr Thr Val Arg Val Pro Gln Leu 370 380 370 375 Gly Ala Trp Ser Met Met Thr Ala Gln Val Asn Val Asn Lys Gly 390

<210> 83 <211> 583 <212> PRT <213> Festuca arundinacea

<400> 83 Met Gly Asn Pro Lys Trp Ile Phe Ala Pro Trp Ala Val Leu Leu 10 Phe Leu Leu Gln Leu Ala Cys Ala Ser His His Thr Arg Arg Ser Leu 20 25 Glu Thr Glu Ala Ala Ser Pro Ser Val Pro Ala Ser Ile Val Ser Pro 35 40 Leu Leu Arg Thr Gly Tyr His Phe Gln Pro Pro Met Asn Trp Ile Asn 55 60 Asp Pro Asn Gly Pro Leu Tyr Tyr Lys Gly Trp Tyr His Leu Phe Tyr 75 70 Gln Tyr Asn Pro Lys Gly Ala Val Trp Gly Asn Ile Ile Trp Ala His 90 95 8.5 Ser Val Ser Arg Asp Leu Ile Asn Trp Ile Ala Leu Glu Pro Ala Ile 100 105 110 Thr Pro Ser Ile Pro Thr Asp Lys Tyr Gly Val Trp Ser Gly Ser Thr 115 120 125 Thr Ile Leu His Asp Gly Thr Pro Ala Ile Leu Tyr Thr Gly Ile Asp 130 135 140 Arg Pro Ser Ile Asn Tyr Gln Ile Gln Asn Ile Ala Leu Pro Lys Asn 145 150 155 Ala Ser Asp Pro Leu Leu Arg Glu Trp Tyr Lys Pro Gly Tyr Asn Pro 165 170 175 Ile Ala Val Pro Val Ala Gly Met Asn Ala Thr Gln Phe Arg Asp Pro 180 185 190 Thr Thr Ala Trp Phe Ala Gly Arg His Trp Arg Met Leu Val Gly Gly 195 200 205 Leu Arg Pro Gly Thr Leu Arg Gly Glu Ala Ile Leu Tyr Arg Ser Leu 210 215 Asp Phe Lys Asn Trp Thr Arg Ala His His Pro Leu His Ser Ala Leu 235 225 230 Thr Gly Met Trp Glu Cys Pro Asp Phe Phe Pro Val Gly Glu Ala Gly 245 250 Val Glu Lys Gly Leu Asp Thr Ser Glu His Gly Glu Gly Val Glu Lys 260 265 270 His Val Leu Lys Asn Ser Leu Asp Leu Thr Arg Tyr Asp Tyr Tyr Thr 275 280 285 Val Gly Thr Tyr Asp Asn Val Lys Glu Arg Tyr Val Pro Asp Asn Pro 290 295 Thr Gly Asp Val Tyr Arg Arg Leu Gln Tyr Asp Tyr Gly Asn Phe Tyr 305 310 315 Ala Ser Lys Thr Phe Phe Asp Pro Val Lys Gln Arg Arg Ile Leu Leu 325 330 335 Gly Trp Ala Asn Glu Ser Asp Ser Val Ala His Asp Lys Ala Lys Gly 340 345 350 Trp Ala Gly Ile Gln Ala Ile Pro Arg Lys Ile Trp Leu Asp Pro Ser 355 360 365 355 360 Gly Lys Gln Leu Val Gln Trp Pro Val Glu Glu Leu Glu Lys Leu Arg 370 375 Gly Lys Pro Val Thr Val Gly Asp Lys Val Val Lys Pro Gly Gln His 395 390 Phe Glu Val Thr Gly Leu Gln Ser Tyr Gln Ser Asp Val Glu Val Ser 410 415 405 Phe Glu Val Ser Ser Leu Asp Lys Ala Glu Pro Phe Asp Pro Ala Tyr 425 430 420 Ser Asn Asp Ala Gln Lys Leu Cys Gly Ile Lys Gly Ala Asp Ala Asn 435 440 445 435 440 Gly Gly Val Gly Pro Phe Gly Leu Val Val Leu Ala Ser Ala Asp Leu 450 455 460 Ala Glu Lys Thr Ala Val Phe Phe Arg Val Phe Lys Asp Gly Tyr Gly 470 475

67

```
Lys Pro Ile Val Leu Met Cys Ser Asp Pro Thr Lys Ser Ser Leu Thr
                           490
Pro Asp Leu Tyr Lys Pro Thr Phe Ala Gly Phe Val Asp Thr Asp Ile
        500 505 510
Ser Ser Gly Lys Ile Ser Leu Arg Ser Leu Ile Asp Arg Ser Val Val
    515 520
                         525
Glu Ser Phe Gly Ala Gly Gly Lys Thr Cys Ile Leu Ser Arg Val Tyr
                 535
                         540
Pro Ser Met Ala Leu Gly Lys Asn Ala His Leu His Val Phe Asn Asn
545 550 555 560
Gly Glu Thr Asp Ile Lys Val Ser Lys Leu Thr Val Trp Glu Met Lys
     565 570 575
Arg Pro Leu Met Asn Gly Ala
        580
<210> 84
<211> 346
<212> PRT
<213> Lolium perenne
<400> 84
Met Tyr Tyr Asn Gly Ile Tyr His Glu Phe Tyr Gln Tyr Asn Pro Asn
   5
                        10
Gly Ser Leu Trp Gly Asn Ile Ile Trp Gly His Ser Val Ser Thr Asp
                        25
Leu Ile Asn Trp Ile Pro Val Glu Pro Ala Ile Glu Arg Asp Ile Pro
                   40
 35
Ser Asp Ile Asn Gly Cys Trp Thr Gly Ser Ala Thr Ile Ile Ser Gly
                <sup>1</sup> 55
                           60
Asp Gln Pro Ile Ile Ile Tyr Thr Gly Ala Asp Lys Glu Asn Arg Gln
             70 75
Leu Gln Asn Ile Val Leu Pro Lys Asn Lys Ser Asp Pro Tyr Leu Arg
85 90 95
Glu Trp Thr Lys Ala Gly Asn Asn Pro Val Ile Gln Pro Val Gly Pro
        100 105
Gly Leu Asn Ala Ser Gln Phe Arg Asp Pro Thr Thr Gly Trp Ile Gly
    115 120 125
Pro Asp Gly Leu Trp Arg Ile Ala Val Gly Ala Glu Leu Asn Gly Tyr
                  135
                         140
Gly Ala Ala Leu Leu Tyr Lys Ser Gln Asp Phe Leu Asn Trp Thr Arg
145 150 155 160
Val Asp His Pro Leu Tyr Ser Ser Asn Ala Ser Ser Met Trp Glu Cys
      165 170
Pro Asp Phe Phe Ala Val Leu Pro Gly Asn Ser Gly Gly Leu Asp Leu
                        185 190
        180
Ser Ala Glu Ile Pro Asn Gly Ala Lys His Val Leu Lys Met Ser Leu
                     200
                         205
Asp Ser Cys Asp Lys Tyr Met Ile Gly Val Tyr Asp Leu Lys Ser Asp
                 215
                                 220
Thr Phe Met Pro Asp Ser Val Leu Asp Asp Arg Arg Leu Trp Ser Arg
225 230 235 240
Ile Asp His Gly Asn Phe Tyr Ala Ser Lys Ser Phe Phe Asp Ser Lys
      245 250 255
Lys Gly Arg Arg Ile Ile Trp Gly Trp Thr Asn Glu Thr Asp Ser Ser
         260
                        265 270
Ser Asp Asp Val Ala Lys Gly Trp Ala Gly Ile His Ala Ile Pro Arg
                    280 285
Thr Ile Trp Leu Asp Ser Tyr Gly Lys Gln Leu Leu Gln Trp Pro Ile
       295
                                 300
Glu Glu Ile Glu Ser Leu Arg Arg Asn Glu Ile Ser His Gln Gly Leu
       310 315 320
Glu Leu Lys Lys Gly Asp Leu Phe Glu Ile Lys Gly Thr Asp Thr Ser
         325 330
Gln Val Val His Val Phe Leu Gly Lys Leu
```

<210> 85 <211> 581 <212> PRT <213> Festuca arundinacea <400> 85 Met Ala Gly Leu Arg Leu Ala Ala Val Ala Phe His Leu Cys Leu Leu 10 Leu Ser Pro Ser Ser Ser Leu Arg Arg Leu Tyr His Glu Asp Asp Glu 25 Ala Glu Ser Thr Pro Gly His Gly Gly Ser Arg Thr Ala Tyr His Phe 40 Gln Pro Ala Lys Asn Trp Gln Asn Asp Pro Asn Gly Pro Met Tyr His 55 Asn Gly Leu Tyr His Leu Phe Tyr Gln Tyr Asn Pro Arg Gly Ala Thr 70 75 Trp Gly Asn Gly Asn Leu Ser Trp Gly His Ser Val Ser Val Asp Leu 90 85 Val Asn Trp Ala Ala Leu Asp Thr Ala Leu Asp Pro Asp Ser Pro Phe 105 110 100 Asp Ala Asn Gly Cys Trp Ser Gly Ser Ala Thr Ile Leu Pro Asp Gly 115 120 Gln Pro Ala Ile Leu Tyr Thr Gly Ile Asp Ala Ala Gly Asn Gln Val 130 135 140 Gln Asn Val Ala Phe Pro Lys Lys Ala Ser Asp Pro Leu Leu Arg Glu 145 150 155 Trp Val Lys Pro Asp Tyr Asn Pro Val Ile Pro Leu Pro Lys Asp Val 170 175 165 Val His Asp Ser Phe Arg Asp Pro Ser Thr Ala Trp Arg Gly Arg Asp 180 185 190 Gly Leu Trp Arg Val Ala Ile Ala Ala Lys Val Asn Val Thr Val Thr 195 200 205 Val Gly Ser Thr Leu Ile Tyr Arg Ser Lys Asp Phe Arg Arg Trp Glu 210 215 220 Arg Asn Ala Ala Pro Leu Tyr Glu Ser Leu Ala Ala Gly Met Val Glu 225 230 235 Cys Pro Asp Leu Phe Pro Val Ala Lys Pro Gly Ala Gln Asn Gly Leu 250 255 245 Asp Tyr Ala Pro Ser Ser Arg Ala Ala Arg His Val Leu Lys Leu Ser 260 265 Val Val Ala Thr Leu Gln Asp Tyr Tyr Val Val Gly Leu Tyr Asp Asp 275 280 Thr Ala Asp Thr Phe Asn Ala Ala Gly Ala Asp Asn Asp Trp Arg 290 295 300 Thr Trp Arg Arg Ile Asp Tyr Gly His Val Tyr Ala Ser Lys Ser Phe 315 320 310 Phe Asp Ala Arg Lys Asn Arg Arg Val Leu Trp Cys Trp Ala Asn Glu 335 330 325 Ser Asp Thr Glu Ala Asp Tyr Ile Ala Arg Gly Trp Ser Gly Val Gln 340 345 350 Thr Val Pro Arg Lys Ile Trp Leu Asp Ile Asp Gly Lys Gln Leu Leu 355 360 365 Gln Trp Pro Ile Lys Glu Ile Glu Thr Leu Arg Lys Lys Arg Val Gly 380 375 Leu Leu Gly Thr Glu Met Asn Ser Gly Gly Leu Asn Glu Ile Ile Gly 390 395 Val Ala Gly Ser Gln Ala Asp Val Glu Val Val Phe Lys Ile Pro Thr 415 405 410 Leu Glu Gly Ala Glu Asn Ile Glu Pro Asn Glu Leu Leu Asp Pro Gln 430 420 425 Lys Leu Cys Gly Asn Asn Gly Ala Ser Met Arg Gly Ser Ile Gly Pro 445 435 440 Phe Gly Leu Leu Leu Ala Ser Gly Asp Leu Leu Glu His Thr Ser 460 455 Val Phe Phe Arg Val Phe Lys His Gly Ala Lys Tyr Lys Val Leu Met 470 475

 Cys
 Thr
 Asp
 Leu
 Thr
 Arg
 Ser
 Thr
 Arg
 Ser
 Asp
 Eve
 Asp
 Thr
 Arg
 Ser
 Asp
 Ile
 Asp</th

<210> 86

<211> 588

<212> PRT

<213> Lolium perenne

<400> 86

Met Gly Val Arg Leu Gly Arg Val Ala Trp Ala Cys Pro Ala Val Leu 10 15 1 5 Val Leu Leu Leu Gln Leu Ala Gly Ala Ser His Val Val Tyr Glu Thr 25 Ser Leu Leu Glu Thr Glu Ala Ala Ala Ala Thr Val Pro Ala Ser Ile 35 40 Phe Glu Leu Ser Thr Gly Tyr His Phe Arg Pro Gln Lys Asn Trp Ile 55 60 Asn Asp Pro Asn Ala Pro Leu Tyr Tyr Lys Gly Trp Tyr His Leu Phe 65 70 75 . 80 Phe Gln Tyr Asn Pro Lys Gly Ala Val Trp Gly Asn Ile Val Trp Ala 85 90 His Ser Val Ser Arg Asp Leu Ile Asn Trp Val Ala Leu Glu Thr Ala 105 110 100 Leu Ala Pro Ser Ile Asp Ala Asp Lys Tyr Gly Cys Trp Ser Gly Ser 115 120 125 Ala Thr Ile Met Pro Asp Gly Thr Pro Val Ile Met Tyr Thr Gly Val 130 135 140 Ser Arg Pro Asp Val Asn Tyr Glu Val Gln Asn Val Ala Phe Pro Lys 145 150 155 160 Asn Ser Ser Asp Pro Leu Leu Arg Glu Trp Val Lys Pro Ala His Asn 170 175 Pro Val Ile Val Pro Glu Gly Gly Ile Asn Ala Thr Gln Phe Arg Asp 180 185 Pro Thr Thr Ala Trp Tyr Ala Asp Gly His Trp Arg Ile Leu Val Gly 200 Ala Leu Ser Gly Ala Ser Arg Gly Val Ala Tyr Val Tyr Arg Ser Arg 220 215 Asp Phe Arg Arg Trp Thr Arg Val Arg Lys Pro Leu His Ser Ala Pro 230 235 240 Thr Gly Met Trp Glu Cys Pro Asp Phe Tyr Pro Val Thr Val Asp Gly 245 250 255 Lys Glu Ser Gly Val Asp Thr Ser Val Val Ser Ser Ser Arg Val Lys 260 265 270 His Val Leu Lys Asn Ser Leu Asp Leu Arg Arg Tyr Asp Tyr Tyr Thr 275 280 285 Val Gly Thr Tyr Asp Arg Leu Lys Glu Arg Tyr Val Pro Asp Asn Pro 295 300 Ala Gly Asp Lys His His Leu Arg Tyr Asp Tyr Gly Asn Phe Tyr Ala 310 315 Ser Lys Thr Phe Tyr Asp Pro Ser Lys Arg Arg Ile Leu Trp Gly 325 330 335 Trp Ala Asn Glu Ser Asp Thr Ala Val Asp Asp Val Ala Lys Gly Trp

Ala Gly Ile Gln Ala Ile Pro Arg Lys Val Trp Leu Asp Pro Ser Gly 360 Arg Gln Leu Met Gln Trp Pro Val Glu Glu Val Lys Ala Leu Arg Gly 375 380 Lys Lys Pro Val Ser Leu Lys Asp Arg Met Val Lys Arg Gly Glu His 390 395 Val Glu Val Thr Gly Leu Gln Thr Ala Gln Ala Asp Val Glu Val Ser 410 415 405 Phe Glu Val Pro Ser Leu Glu Gly Ala Glu Ala Leu Asp Pro Ala Leu 420 425 430 Ala Asn Asp Ala Gln Lys Leu Cys Gly Val Lys Gly Ala Asp Val Glu 435 440 445 Gly Gly Val Gly Pro Phe Gly Leu Trp Val Leu Ala Ser Ser Lys Leu 450 455 Glu Glu Arg Thr Ala Val Phe Phe Arg Val Phe Lys Ala Ala Gly Asn 475 465 470 Val Asn Ser Thr Lys Pro Leu Val Leu Met Cys Ser Asp Pro Thr Lys 490 495 485 Ser Ser Leu Asn Lys Asn Leu Tyr His Pro Thr Phe Ala Gly Phe Val 500 505 510 Asp Ile Asp Met Ala Lys Gly Lys Ile Ser Leu Arg Ser Leu Ile Asp 515 520 525 Gln Ser Val Val Glu Ser Phe Gly Ala Gly Gly Arg Thr Cys Ile Leu 530 535 Ser Arg Val Tyr Pro Ser Leu Ala Ile Gly Arg Asn Ala His Leu His 550 555 Val Phe Asn Asn Gly Lys Ala Asp Ile Lys Val Ser Arg Leu Thr Ala 570 575 565 Trp Glu Met Lys Lys Pro Ala Leu Met Asn Gly Ala 580

<210> 87

<211> 668

<212> PRT

<213> Lolium perenne

<400> 87

Met Glu Ala Arg Asp Gly Val Ser Met Pro Tyr Ser Tyr Ala Ala Leu 10 Pro Glu Asp Ala Glu Ala Ala Val Val Gly Arg Gly Arg Thr Gly 25 Pro Leu Phe Ala Ala Leu Leu Leu Thr Leu Val Ala Ala Leu Leu Ala 35 40 Val Ala Ala Leu Ala Gly Val Arg Leu Val Gly Glu Leu Pro Ala Gly 50 55 Gly Val Val Met Pro Asn His Pro Met Glu Val Met Asp Val Ser Gly 7.5 70 Ser Arg Gly Pro Glu Ser Gly Val Ser Glu Lys Thr Ser Gly Ala Ala 90 Ser Glu Ser Gly Gly Met Leu Gly Ala Asp Ala Gly Ser Asn Ala Phe 105 110 100 Pro Trp Ser Asn Ala Met Leu Gln Trp Gln Arg Thr Gly Phe His Phe 115 125 120 Gln Pro Glu Lys Asn Trp Met Asn Asp Pro Asn Gly Pro Val Tyr Tyr 135 140 Lys Gly Trp Tyr His Leu Phe Tyr Gln Tyr Asn Pro Glu Gly Ala Ile 155 150 Trp Gly Asn Lys Ile Ala Trp Gly His Ala Val Ser Arg Asp Met Leu 170 165 Arg Trp Arg His Leu Pro Ile Ala Met Phe Pro Asp Gln Trp Tyr Asp 190 180 185 Ile Asn Gly Ala Trp Ser Gly Ser Ala Thr Val Leu Pro Asp Gly Arg 195 200 205 Ile Val Met Leu Tyr Thr Gly Ser Thr Asn Ala Ser Val Gln Val Gln 215

Cys Leu Ala Phe Pro Ser Asp Pro Ser Asp Pro Leu Leu Thr Asn Trp 230 235 Thr Lys Tyr Glu Gly Asn Pro Val Leu Tyr Pro Pro Pro His Val Gly 250 255 245 Glu Lys Asp Phe Arg Asp Pro Thr Thr Ala Trp Tyr Asp Gly Ser Asp 270 260 265 Gly Met Trp Arg Ile Val Ile Gly Ser Lys Asp Asn Arg Arg Ala Gly 275 280 285 Met Ala Leu Thr Tyr Lys Thr Lys Asn Phe His Asp Phe Glu Leu Val 300 295 Pro Gly Val Leu His Arg Val Pro Ala Thr Gly Met Trp Glu Cys Ile 305 310 315 Asp Leu Tyr Pro Val Gly Gly Ala Arg Gly Ile Asp Met Thr Glu Ala 325 , 330 Val Ala Ala Ala Ser Asn Ser Gly Gly Gly Glu Val Leu His Val Met 345 350 340 Lys Glu Ser Ser Asp Asp Asp Arg His Asp Tyr Tyr Ala Leu Gly Arg 365 360 Tyr Asp Ala Ala Thr Asn Lys Trp Thr Pro Leu Asp Ala Asp Ala Asp 370 375 380 370 375 Val Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Phe Tyr Ala Ser Lys 385 390 395 400 Thr Phe Tyr Asp Pro Ala Lys Lys Arg Arg Val Leu Trp Gly Trp Val 405 410 415 Gly Glu Thr Asp Ser Glu Arg Ala Asp Val Ala Lys Gly Trp Ala Ser 420 425 430 Leu Gln Ser Ile Pro Arg Thr Val Val Leu Asp Thr Lys Thr Gly Ser 445 440 435 Asn Leu Ile Gln Trp Pro Val Val Glu Val Glu Thr Leu Arg Thr Asn 450 455 Ser Thr Asn Leu Gly Ser Ile Ile Val Glu His Gly Ser Val Phe Pro 465 470 475 Leu Ser Leu His Arg Ala Thr Gln Leu Asp Ile Glu Ala Ser Phe Arg 485 490 Leu Asp Pro Leu Asp Val Ala Ala Ala Lys Glu Ala Asp Val Gly Tyr 510 505 Asn Cys Ser Thr Ser Gly Gly Ala Ala Gly Arg Gly Ala Leu Gly Pro 525 515 520 Phe Gly Leu Leu Val Leu Ala Asp Ala Arg Arg His Gly Gly Asp Thr 530 535 540 Glu Gln Thr Ala Val Tyr Phe Tyr Val Ala Arg Gly Leu Asp Gly Asn 545 550 555 Leu Arg Thr His Phe Cys His Asp Glu Ser Arg Ser Ser Arg Ala Asn 565 570 575 Asp Ile Val Lys Arg Val Val Gly Asn Ile Val Pro Val Leu Asp Gly 585 590 Lys Ala Leu Ser Val Arg Val Leu Val Ala His Ser Ile Val Glu Ser 605 600 Phe Ala Gln Gly Gly Arg Ser Val Val Thr Ser Arg Val Tyr Pro Thr 610 615 620 Glu Ala Ile Tyr Ala Asn Ala Gly Val Tyr Leu Phe Asn Asn Ala Thr 630 635 640 Gly Ala Arg Val Pro Ala Thr Ser Leu Val Val His Lys Met Asp Pro 650 645 Ser Tyr Asn Gln Asn Gln Ala Glu Met Ala Ser Leu

<210> 88

<211> 473

<212> PRT

<213> Lolium perenne

<400> 88

Val His Trp Arg His Leu Pro Leu Ala Met Val Pro Asp Gln Trp Tyr

1 5 10 15

```
Asp Ile Asn Gly Val Trp Thr Gly Ser Ala Thr Val Phe Pro Asp Gly
                         25
Thr Leu Asn Met Leu Tyr Thr Gly Ser Thr Asn Ala Ser Val Gln Ala
                                    45
Gln Cys Leu Ala Val Pro Glu Asp Pro Asn Asp Ser Leu Leu Arg Asn
 50 55
Trp Thr Lys His Glu Ala Asn Pro Val Leu Leu Pro Pro Pro Gly Ile
                   75 80
              70
Gly Asp Lys Asp Phe Arg Asp Pro Thr Thr Ala Trp Phe Asp Glu Ser
                90 95
      85
Asp Gln Thr Trp Arg Thr Val Ile Gly Ser Lys Asp Asn Asn Gly His
                      105 110
  100
Ala Gly Ile Ala Met Val Tyr Lys Thr Lys Asp Phe Leu Asn Tyr Glu
     115 120 125
Leu Ile Pro Gly Tyr Leu His Arg Val Asp Gly Thr Gly Met Trp Glu
                                  140
                  135
Cys Ile Asp Phe Tyr Pro Val Gly Gly Lys Asn Gly Ser Glu Glu Leu
                       155
              150
Tyr Val Ile Lys Glu Ser Ser Asp Asp Asp Arg His Asp Trp Tyr Thr
      165 170 175
Leu Gly Lys Tyr Asp Ala Ala Ala Asn Thr Phe Thr Ala Ala Asp Pro
       180 185 190
Glu Asn Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Phe Tyr
      195 200 205
Ala Ser Lys Thr Phe Tyr Asp Pro Ala Lys Lys Arg Arg Val Leu Trp
                  215 220
Gly Trp Ile Gly Glu Thr Asp Ser Glu Arg Ala Asp Val Ala Lys Gly
                    235
225 230
Trp Ala Ser Leu Met Ser Ile Pro Arg Thr Val Glu Leu Asp Glu Lys
   245 250 255
Thr Trp Thr Asn Leu Ile Gln Trp Pro Val Glu Glu Ile Glu Thr Leu
  260 265 270
Arg Ile Lys Ser Thr Asp Leu Gly Gly Ile Thr Ile Asp His Gly Ser
275 280 285
Val Tyr Pro Leu Pro Leu His Arg Ala Thr Gln Leu Asp Ile Glu Ala
 290 295 300
Ser Phe Arg Leu Asp Ala Ala Thr Val Ala Ala Leu Asn Glu Ala Asp
305 310
                               315
Val Gly Tyr Asn Cys Ser Thr Ser Gly Gly Ser Thr His Arg Gly Ala
         325 330 335
Leu Gly Pro Phe Gly Ile Leu Val Leu Ala Asp Gly Lys Ala Glu Gln
         340 345
Thr Ala Val Tyr Phe Tyr Val Ser Lys Gly Leu Asp Gly Ala Leu Glu
355 360 365
Thr His Phe Cys His Asp Glu Ser Arg Ser Thr Leu Ala Lys Asp Val
                                  380
                  375
Val Lys Arg Val Val Gly Tyr Thr Val Pro Val Leu Asp Gly Glu Ala
                390 395
Phe Ser Val Arg Val Leu Val Asp His Ser Ile Val Glu Ser Phe Ala
            405 410 415
Met Gly Gly Arg Ser Thr Ala Thr Ser Arg Val Tyr Pro Thr Glu Ser 420 425 430
Ile Tyr Gly Ala Ala Gly Ala Tyr Leu Phe Asn Asn Ala Thr Gly Gly 435 440 445
Ser Val Thr Val Glu Lys Leu Val Val His Glu Met Asp Ser Ser Tyr
                 455
Asn Gln Ile Phe Met Ala Asp Asp Leu
465 470
```

<210> 89

<211> 539

<212> PRT

<213> Lolium perenne

WO 03/040306 PCT/NZ02/00239

<400> 89															
			Ser	Arg 5	Leu	Pro	Asp	Ile	Asp 10	Ile	Pro	Thr	His	Met 15	Pro
Leu	His	Asp	Tyr 20	Cys	Phe	Ala	Thr	Ala 25	Ala	Ser	Ala	Pro	Asp 30	Ala	Pro
_		35					40					45		Glu	
	50					55					60			Gly	•
65					70					75				Glu	80
				85					90					Thr 95	
			100					105					110	Val	
	_	115					120					125		Lys	
_	130					135					140			Ile	
145					150					155				Gly	160
				165					170					Ser 175	
			180					185					190	Leu	
		195					200					205		Ala	
	210					215					220			Glu	
225					230					235				Asn	240
				245					250					Met 255 Arg	
			260					265					270	Lys	
		275					280					285		Leu	
	290					295					300			Gly	
305					310					315				Ala	320
				325					330					335 Pro	
			340	1				345					350	Lys	
		355					360	•				365		Gly	
	370					375					380			. Asp	
385					390					395				Thr	400
				405	•				410)				415 Asp	
			420)				425	ı				430	Ala	
		435	5				440)				445)	. Ala	
	450	ı				455	5				460	1		Phe	
465	ı				470)				475	,)			Glu	480
				485	5				490)				495 Tyr	
	·		500				•	505					510)	

Thr His Ala Ile Pro Lys Ser Ala Ser Gly Lys Ile Leu Arg Lys Glu 520 Leu Arg Ala Lys Leu Ala Ala Pro Ala Thr Ala 535 530

<210> 90 <211> 559

<212> PRT

<213> Lolium perenne

<400> 90 Met Gly Ser Ile Ala Ala Asp Leu Ala Pro Glu Ala Pro Ala Glu Leu 1.0 Val Phe Arg Ser Lys Leu Pro Asp Ile Glu Ile Pro Thr His Leu Thr 25 Leu Gln Asp Tyr Cys Phe Glu Arg Leu Pro Glu Leu Ser Ala Arg Ala 40 35 Cys Leu Ile Asp Gly Ala Thr Gly Ala Ala Leu Thr Tyr Gly Glu Val 55 Asp Ala Leu Ser Arg Arg Cys Ala Ala Gly Leu Arg Arg Leu Gly Val 70 75 Arg Lys Gly Asp Val Val Met Ala Leu Leu Arg Asn Cys Pro Glu Phe 90 Ala Phe Val Phe Leu Gly Ala Ala Arg Leu Gly Ala Ala Thr Thr Thr 110 105 Ala Asn Pro Phe Tyr Thr Pro His Glu Ile His Arg Gln Ala Ala Ala 115 120 125 Ala Gly Ala Lys Val Ile Val Thr Glu Ala Cys Ala Val Glu Lys Val 135 140 Arg Ala Phe Ala Ala Glu Arg Gly Ile Pro Val Val Ser Val Asp Glu 145 150 155 Ala Val Asp Asp Gl $ar{ exttt{y}}$ Cys Leu Pro Phe Ala Ala Thr Leu Leu Gly Glu 165 170 175 Glu Ser Gly Glu Arg Phe Val Asp Glu Ala Val Asp Pro Asp Asp Val 185 190 180 Val Ala Leu Pro Tyr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val 195 200 205 Met Leu Thr His Arg Ser Leu Val Thr Ser Val Ala Gln Gln Val Asp 215 220 Gly Glu Asn Pro Asn Leu His Phe Ser Ser Ser Asp Val Leu Leu Cys 225 230 235 240 Val Leu Pro Leu Phe His Ile Tyr Ser Leu Asn Ser Val Leu Leu Ala 250 255 Gly Leu Arg Ala Gly Cys Ala Ile Val Ile Met Arg Lys Phe Asp His 270 260 265 Gly Ala Leu Val Asp Leu Val Arg Ala His Gly Val Thr Val Ala Pro 285 275 280 Phe Val Pro Pro Ile Val Val Glu Ile Ala Lys Ser Ala Arg Val Thr 300 295 Ala Ala Asp Leu Ala Ser Ile Arg Leu Val Met Ser Gly Ala Ala Pro 305 310 315 320 Met Gly Lys Glu Leu Gln Asp Ala Phe Met Ala Lys Ile Pro Asn Ala 325 330 335 Val Leu Gly Gln Gly Tyr Gly Met Thr Glu Ala Gly Pro Val Leu Ala 340 345 Met Cys Leu Ala Phe Ala Lys Glu Pro Phe Glu Val Lys Ser Gly Ser 355 360 Cys Gly Thr Val Val Arg Asn Ala Glu Leu Lys Ile Val Asp Pro Asp 380 375 Thr Gly Ala Ser Leu Gly Arg Asn Leu Pro Gly Glu Ile Cys Ile Arg 390 395 400 Gly Lys Gln Ile Met Lys Gly Tyr Leu Asn Asp Pro Glu Ala Thr Lys 405 410

Asn Thr Ile Asp Lys Asp Gly Trp Leu His Thr Gly Asp Ile Gly Tyr

425

```
Val Asp Asp Asp Glu Ile Phe Ile Val Asp Arg Leu Lys Glu Ile
                     440
Ile Lys Tyr Lys Gly Phe Gln Val Pro Pro Ala Glu Leu Glu Ala Leu
                         460
                 455
Leu Ile Thr His Pro Glu Ile Lys Asp Ala Ala Val Val Ser Met Gln
                               475
465 470
Asp Glu Leu Ala Gly Glu Val Pro Val Ala Phe Val Val Arg Thr Glu
                490 495
            485
Gly Ser Glu Ile Ser Glu Asn Glu Ile Lys Gln Phe Val Ala Lys Glu
       500 505 510
Val Val Phe Tyr Lys Arg Ile Cys Lys Val Phe Phe Ala Asp Ser Ile
                   520 525
Pro Lys Ser Pro Ser Gly Lys Ile Leu Arg Lys Asp Leu Arg Ala Lys
  530 535 540
Leu Ala Ala Gly Ile Pro Gly Ser Asp Thr Thr Gln Ser Lys Asn
               550
<210> 91
<211> 559
<212> PRT
<213> Festuca arundinacea
<400> 91
Met Gly Ser Ile Ala Ala Asp Ala Pro Glu Ala Pro Pro Ala Glu Leu
1 5
                           10
Val Phe Arg Ser Lys Leu Pro Asp Ile Glu Ile Pro Thr His Leu Thr
                                      30
                         25
         20
Leu Gln Asp Tyr Cys Phe Gln Arg Leu Pro Glu His Ser Ala Arg Ala
                   40
      35
Cys Leu Ile Asp Gly Ala Thr Gly Ala Ala Leu Thr Tyr Gly Glu Val
                         60
                55
Asp Ala Leu Ser Arg Arg Cys Ala Ala Gly Leu Arg Arg Leu Gly Val
                               75
                70
Arg Lys Gly Asp Val Val Met Ala Leu Leu Arg Asn Cys Pro Glu Phe
                           90 95
          85
Ala Phe Val Phe Leu Gly Ala Ala Arg Leu Gly Ala Ala Thr Thr Thr
         100
                                      110
                        105
Ala Asn Pro Phe Tyr Thr Pro His Glu Ile His Arg Gln Ala Thr Ala
              120 125
Ala Gly Ala Lys Val Ile Val Thr Glu Ala Cys Ala Val Glu Lys Val
 130 135 140
Arg Ala Phe Ala Ala Glu Arg Gly Ile Thr Val Val Ser Val Asp Glu
                             155
145 150
Gly Val Asp Asp Gly Cys Leu Pro Phe Gly Glu Thr Leu Leu Gly Glu
                           170 175
             165
Asp Gly Gly Glu Arg Phe Val Asp Glu Ala Val Asp Pro Asp Asp Val
                                        190
                         185
         180
Val Ala Leu Pro Tyr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val
                    200
 Met Leu Thr His Arg Ser Leu Val Thr Ser Val Ala Gln Gln Val Asp
  210 215 220
 Gly Glu Asn Pro Asn Leu His Phe Ser Ser Ser Asp Val Leu Leu Cys
                             235 240
              230
 Val Leu Pro Leu Phe His Ile Tyr Ser Leu Asn Ser Val Leu Leu Ala
                            250
           245
 Gly Leu Arg Ala Gly Cys Ala Ile Val Ile Met Arg Lys Phe Asp His
                         265
                                         270
         260
 Gly Ala Leu Val Asp Leu Val Arg Ala His Gly Val Thr Val Ala Pro
                      280
 Phe Val Pro Pro Ile Val Val Glu Ile Ala Lys Ser Ala Arg Val Thr 290 295 300
 Ala Ala Asp Leu Ala Ser Ile Arg Leu Val Met Ser Gly Ala Ala Pro
 305 310 315 320
 Met Gly Lys Glu Leu Gln Asp Ala Phe Met Ala Lys Ile Pro Asn Ala
```

```
Val Leu Gly Gln Gly Tyr Gly Met Thr Glu Ala Gly Pro Val Leu Ala
                          345
Met Cys Leu Ala Phe Ala Lys Glu Pro Phe Glu Val Lys Ser Gly Ser
                    360
                                      365
Cys Gly Thr Val Val Arg Asn Ala Glu Leu Lys Ile Val Asp Pro Asp
                   375
Thr Gly Ala Ser Leu Gly Arg Asn Leu Pro Gly Glu Ile Cys Ile Arg
             390 395
Gly Lys Gln Ile Met Lys Gly Tyr Leu Asn Asp Pro Glu Ala Thr Lys
                 410 415
            405
Asn Thr Ile Asp Lys Asp Gly Trp Leu His Thr Gly Asp Ile Gly Tyr
                         425
       420
Val Asp Asp Asp Glu Ile Phe Ile Val Asp Arg Leu Lys Glu Ile
     435
                     440
Ile Lys Tyr Lys Gly Phe Gln Val Pro Pro Ala Glu Leu Glu Ala Leu
                       460
                455
Leu Ile Thr His Pro Glu Ile Lys Asp Ala Ala Val Val Ser Met Gln
                       475
       470
Asp Glu Leu Ala Gly Glu Val Pro Val Ala Phe Val Val Arg Thr Glu
                    490 495
           485
Gly Ser Glu Ile Ser Glu Asn Glu Ile Lys Gln Phe Val Ala Lys Glu
       500
                        505
Val Val Phe Tyr Lys Arg Ile Cys Lys Val Phe Phe Ala Asp Ser Ile
 515 520 525
Pro Lys Ser Pro Ser Gly Lys Ile Leu Arg Lys Asp Leu Arg Ala Lys
                                  540
                  535
Leu Ala Ala Gly Ile Pro Gly Ser Glu Thr Thr Gln Ser Lys Ser
                       555 <sub>.</sub>
545 550
<210> 92
<211> 557
<212> PRT
<213> Lolium perenne
<400> 92
Met Gly Ser Val Pro Glu Glu Ser Val Val Ser Val Ala Ala Ala Glu
                             10
Thr Val Phe Arg Ser Lys Leu Pro Asp Ile Glu Ile Asn Asn Glu Gln
         20
                          25
Thr Leu Gln Ser Tyr Cys Phe Glu Lys Met Ala Glu Val Ala Ser Arg
                      40
                             4.5
Pro Cys Ile Ile Asp Gly Gln Thr Gly Ala Ser Tyr Thr Tyr Thr Glu
                55
Val Asp Tyr Leu Thr Arg Arg Ala Ala Ala Gly Leu Arg Arg Met Gly
65 70
Val Gly Lys Gly Asp Val Val Met Asn Leu Leu Arg Asn Cys Pro Glu
            85
                             90
Phe Ala Phe Ser Phe Leu Gly Ala Ala Arg Leu Gly Ala Ala Thr Thr
                          105 110
          100
Thr Ala Asn Pro Phe Tyr Thr Pro His Glu Ile His Arg Gln Ala Glu
     115 120 125
Ala Ala Gly Ala Lys Leu Ile Val Thr Glu Ala Cys Ala Val Glu Lys
         135
                                   140
Val Leu Glu Phe Ala Ala Gly Arg Gly Leu Pro Val Val Thr Val Asp
                               155
145 150
Gly Arg Arg Asp Gly Cys Val Asp Phe Ala Glu Leu Ile Ala Gly Glu
                           170 175
            165
Glu Leu Pro Glu Ala Asp Glu Ala Gly Ile Leu Pro Asp Asp Val Val
          180
                          185
                                          190
Ala Leu Pro Tyr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met
                                205
     195
                      200
Leu Thr His Arg Ser Leu Val Thr Ser Val Ala Gln Leu Val Asp Gly
                           220
 210 215
 Ser Asn Pro Asn Val Cys Phe Asn Lys Asp Asp Ala Leu Leu Cys Leu
```

```
Leu Pro Leu Phe His Ile Tyr Ser Leu His Thr Val Leu Leu Ala Gly
                            250
           245
Leu Arg Val Gly Ala Ala Ile Val Ile Met Arg Lys Phe Asp Val Gly
                265 270
         260
Ala Leu Val Asp Leu Val Arg Ala His Arg Ile Thr Ile Ala Pro Phe
                      280
                                285
Val Pro Pro Ile Val Val Glu Ile Ala Lys Ser Asp Arg Val Gly Ala
 290 295
Asp Asp Leu Ala Ser Ile Arg Met Val Leu Ser Gly Ala Ala Pro Met
305 310 315
Gly Lys Asp Leu Gln Asp Ala Phe Met Ala Lys Ile Pro Asn Ala Val
           325 330 335
Leu Gly Gln Gly Tyr Gly Met Thr Glu Ala Gly Pro Val Leu Ala Met
                              350
                        345
Cys Leu Ala Phe Ala Lys Glu Pro Phe Lys Val Lys Ser Gly Ser Cys
                                      365
   355
                     360
Gly Thr Val Val Arg Asn Ala Glu Leu Lys Val Val Asp Pro Asp Thr
   370 375
                                 380
Gly Ala Ser Leu Gly Arg Asn Gln Pro Gly Glu Ile Cys Val Arg Gly
       390 395
Lys Gln Ile Met Ile Gly Tyr Leu Asn Asp Pro Glu Ser Thr Lys Asn
                   410 415
          405
Thr Ile Asp Lys Asp Gly Trp Leu His Thr Gly Asp Ile Gly Leu Val
                      425 430
Asp Asp Asp Glu Ile Phe Ile Val Asp Arg Leu Lys Glu Ile Ile
     435
                      440
Lys Tyr Lys Gly Phe Gln Val Ala Pro Ala Glu Leu Glu Ala Leu Leu
         455 460
Leu Thr Asn Pro Glu Val Lys Asp Ala Ala Val Val Gly Val Lys Asp
465 470 475
Asp Leu Cys Gly Glu Val Pro Val Ala Phe Ile Lys Arg Ile Glu Gly
                          490
Ser Glu Ile Thr Glu Asn Glu Ile Lys Gln Phe Val Ser Lys Glu Val
                       505 510
       500
Val Phe Tyr Lys Arg Ile Asn Lys Val Tyr Phe Thr Asp Ser Ile Pro
                          525
 515 520
Lys Asn Pro Ser Gly Lys Ile Val Arg Lys Asp Leu Arg Ala Arg Leu
                          540
                535
Ala Ala Gly Ile Pro Thr Glu Val Ala Ala Pro Arg Ser
                550
<210> 93
<211> 557
<212> PRT
<213> Festuca arundinacea
<400> 93
Met Gly Ser Val Pro Glu Glu Ser Val Val Ala Ala Ala Val Ala Glu
      5
                           10
Thr Val Phe Arg Ser Lys Leu Pro Asp Ile Glu Ile Asn Asn Glu Gln
       20
                         25
Thr Leu Gln Ser Tyr Cys Phe Glu Lys Met Ala Glu Val Ala Ser Arg
                      40
                                4.5
Pro Cys Ile Ile Asp Gly Gln Thr Gly Ala Ser Tyr Thr Tyr Thr Glu
                55
                                  60
Val Glu Ser Leu Thr Arg Arg Ala Ala Ala Gly Leu Arg Arg Met Gly
                70
                                75
Val Gly Lys Gly Asp Val Val Met Asn Leu Leu Arg Asn Cys Pro Glu
             85
                           90
Phe Ala Phe Ser Phe Leu Gly Ala Ala Arg Leu Gly Ala Ala Thr Thr
                105
Thr Ala Asn Pro Phe Tyr Thr Pro His Glu Ile His Arg Gln Ala Glu
                     120
                                    125
Ala Ala Gly Ala Lys Val Ile Val Thr Glu Ala Cys Ala Val Glu Lys
                 135
                                   140
```

```
Val Leu Glu Phe Ala Ala Glu Arg Gly Leu Pro Val Val Thr Val Asp
                          155
145 150
Gly Lys Arg Asp Gly Cys Val Asp Phe Ala Glu Leu Ile Ala Gly Glu
              170 175
          165
Glu Leu Pro Glu Ala Glu Glu Ala Gly Ile Leu Pro Asp Asp Val Val
                      185
                           190
        180
Ala Leu Pro Tyr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met
195
                   200 205
Leu Thr His Arg Ser Leu Val Thr Ser Val Ala Gln Leu Phe Asp Gly
210 215 220
Ser Asn Pro Asn Val Cys Phe Asn Lys Asp Asp Ala Leu Leu Cys Leu
225 230 235 240
Leu Pro Leu Phe His Ile Tyr Ser Leu His Thr Val Leu Leu Ala Gly
                         250 255
          245
Leu Arg Val Gly Ala Ala Ile Val Ile Met Arg Lys Phe Asp Val Gly
                               270
      260
                     265
Ala Leu Val Asp Leu Val Arg Ala His Arg Ile Thr Ile Ala Pro Phe
 275 280 285
Val Pro Pro Ile Val Val Glu Ile Ala Lys Ser Asp Arg Val Thr Ala
 290 295 300
Asp Asp Leu Thr Ser Ile Arg Met Val Leu Ser Gly Ala Ala Pro Met
     310
                          315 320
Gly Lys Asp Leu Gln Asp Ala Phe Met Ala Lys Ile Pro Asn Ala Val
          325 330 335
Leu Gly Gln Gly Tyr Gly Met Thr Glu Ala Gly Pro Val Leu Ala Met
      340
                    345
Cys Leu Ala Phe Ala Lys Glu Pro Phe Lys Val Lys Ser Gly Ser Cys
 355 360
Gly Thr Val Val Arg Asn Ala Glu Leu Lys Val Val Asp Pro Asp Thr
      375 380
Gly Ala Ser Leu Gly Arg Asn Gln Pro Gly Glu Ile Cys Val Arg Gly 385 390 395 400
Lys Gln Ile Met Ile Gly Tyr Leu Asn Asp Pro Glu Ser Thr Lys Asn
                         410 415
         405
Thr Ile Asp Lys Asp Gly Trp Leu His Thr Gly Asp Ile Gly Leu Val
                    425 430
        420
Asp Asp Asp Glu Ile Phe Ile Val Asp Arg Leu Lys Glu Ile Ile
     435 440 445
Lys Tyr Lys Gly Phe Gln Val Ala Pro Ala Glu Leu Glu Ala Leu Leu
 450 455 460
Leu Thr Asn Pro Glu Val Lys Asp Ala Ala Val Val Gly Val Lys Asp
465 470
                          475
Asp Leu Cys Gly Glu Val Pro Val Ala Phe Ile Lys Arg Ile Glu Gly
   485 490
Ser Glu Ile Thr Glu Asn Asp Ile Lys Gln Phe Val Ser Lys Glu Val
        500 505 510
Val Phe Tyr Lys Arg Ile Asn Lys Val Tyr Phe Thr Asp Ser Ile Pro
                   520
                          525
Lys Asn Pro Ser Gly Lys Ile Leu Arg Lys Asp Leu Arg Ala Arg Leu
 530 535 540
Ala Ala Gly Ile Pro Thr Glu Val Ala Ala Pro Arg Ser
545 550
<210> 94
<211> 501
<212> PRT
<213> Lolium perenne
```

<400> 94

Met Glu Val Leu Leu Glu Lys Ala Leu Leu Gly Leu Phe Ala Ala 1 5 10 15

Ala Val Leu Ala Ile Ala Val Ala Lys Leu Ala Gly Lys Arg Phe Arg 20 25 30

Leu Pro Pro Gly Pro Ser Gly Ala Pro Ile Val Gly Asn Trp Leu Gln 35 40

Val Gly Asp Asp Leu Asn His Arg Asn Leu Met Gly Ile Ala Lys Arg 55 Phe Gly Glu Val Phe Leu Leu Arg Met Gly Ile Arg Asn Leu Val Val 7.5 70 Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val 90 95 85 Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly 100 105 Asn Gly Gln Asp Met Val Phe Thr Val Tyr Gly Asp His Trp Arg Lys 115 120 125 Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Ala 130 135 140 Gln Asn Arg Val Gly Trp Glu Glu Glu Ala Arg Leu Val Val Glu Asp 145 150 155 Val Lys Ala Asp Pro Ala Phe Ala Thr Ala Gly Thr Val Ile Arg Arg 165 170 Arg Leu Gln Leu Met Met Tyr Asn Asp Met Phe Arg Ile Met Phe Asp 180 185 Arg Arg Phe Glu Ser Val Asp Asp Pro Leu Phe Asn Lys Leu Lys Ala 195 200 205 Met Asn Ala Glu Arg Ser Ile Leu Ser Gln Ser Phe Asp Tyr Asn Tyr 215 220 Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Leu Arg Lys Tyr Leu Asn 225 230 235 Arg Cys Thr Asn Leu Thr Thr Lys Arg Met Lys Leu Phe Glu Asp His 245 250 Phe Val Ala Asp Arg Lys Lys Ala Leu Glu Gln Asn Gly Glu Ile Arg 260 265 270 Cys Ala Met Asp His Ile Leu Glu Ala Glu Arg Lys Gly Glu Ile Asn 275 280 285 His Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn Val Ala Ala Ile 290 295 300 Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala Glu Leu Val Asn 305 310 315 His Pro Asp Val Gln Ser Lys Leu Arg Asp Glu Met Thr Ala Val Leu 325 330 335 Gly Ala Asp Val Ala Val Thr Glu Pro Asp Leu Glu Arg Leu Pro Tyr 345 350 340 Leu Gln Ser Val Val Lys Glu Thr Leu Arg Leu Arg Met Ala Ile Pro 355 360 365 Leu Leu Val Pro His Met Asn Leu Ser Asp Ala Lys Leu Ala Gly Tyr 370 375 380 Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala Trp Phe Leu Ala 385 390 395 Asn Asp Pro Lys Arg Trp Val Arg Ala Asp Glu Phe Arg Pro Glu Arg 410 405 Phe Leu Glu Glu Lys Ala Val Glu Ala His Gly Asn Asp Phe Arg 425 430 420 Phe Val Pro Phe Gly Val Gly Arg Arg Ser Cys Pro Gly Ile Val Leu 435 440 445 Ala Leu Pro Ile Ile Gly Ile Thr Leu Gly Arg Leu Val Gln Asn Phe 455 Gln Leu Leu Pro Pro Pro Gly Gln Asp Lys Ile Asp Thr Thr Glu Lys 465 470 475 Pro Gly Gln Phe Ser Asn Gln Ile Leu Lys His Ala Thr Val Val Cys 490 495 485 Lys Pro Leu Glu Ala 500

<210> 95

<211> 505

<212> PRT

<213> Festuca arundinacea

Met Asp Phe Val Phe Val Glu Lys Leu Leu Val Gly Leu Leu Ala Ser Val Val Val Ala Ile Val Val Ser Lys Ile Arg Gly Arg Lys Leu Arg 20 25 Leu Pro Pro Gly Pro Ile Pro Val Pro Ile Phe Gly Asn Trp Leu Gln 40 Val Gly Asp Asp Leu Asn His Arg Asn Leu Ala Ala Met Ala Arg Lys 55 60 Phe Gly Glu Val Phe Leu Leu Arg Met Gly Ile Arg Asn Leu Val Val 75 70 Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val 85 90 Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly 105 100 Lys Gly Gln Asp Met Val Phe Thr Val Tyr Gly Asp His Trp Arg Lys 125 120 Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Gln 140 130 135 Gln Tyr Arg Ala Gly Trp Glu Ala Glu Ala Ala Phe Val Val Asp Asn 150 155 Val Arg Ala Asp Pro Lys Ala Ala Thr Asp Gly Val Val Leu Arg Arg 165 170 His Leu Gln Leu Met Met Tyr Asn Asn Met Tyr Arg Ile Met Phe Asp 185 Arg Arg Phe Glu Ser Met Asp Asp Pro Leu Phe Leu Arg Leu Arg Ala 195 200 205 Leu Asn Gly Glu Arg Ser Arg Leu Ala Gln Ser Phe Glu Tyr Asn Tyr 210 215 220 Gly Asp Phe Ile Pro Val Leu Arg Pro Phe Leu Arg Gly Tyr Leu Gly 225 230 235 Leu Cys Glu Gln Val Lys Glu Thr Arg Leu Lys Leu Phe Lys Asp Tyr 245 250 255 Phe Leu Asp Glu Arg Lys Lys Leu Ala Ser Thr Lys Ser Met Asp Thr 265 Asn Gly Leu Lys Cys Ala Ile Asp His Ile Leu Glu Ala Gln Glu Lys 275 280 285 Gly Glu Ile Asn Glu Asp Asn Val Leu Tyr Ile Ile Glu Asn Ile Asn 290 295 300 Val Ala Ala Ile Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala 305 310 315 Glu Leu Val Asn His Pro Glu Ile Gln Gln Lys Leu Arg Asp Glu Met 330 335 325 Asp Ala Val Leu Gly Ala Gly His Gln Ile Thr Glu Pro Asp Thr His 350 345 Lys Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Thr Leu Arg Leu Arg 360 Met Ala Ile Pro Leu Leu Val Pro His Met Asn Leu His Asp Ala Lys 375 380 Leu Ala Gly Tyr Asn Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala 385 390 395 Trp Phe Leu Ala Asn Asn Pro Glu Gln Trp Lys Arg Pro Asp Glu Phe 410 415 405 Arg Pro Glu Arg Phe Leu Glu Glu Glu Lys His Val Glu Ala Ser Gly 425 420 Asn Asp Phe Arg Phe Leu Pro Phe Gly Val Gly Arg Arg Ser Cys Pro 440 Gly Ile Ile Leu Ala Leu Pro Ile Leu Gly Ile Thr Ile Gly Arg Leu 450 455 460 Val Gln Asn Phe Glu Leu Thr Thr Pro Pro Gly Val Asp Lys Leu Asp 465 470 475 480 Thr Thr Glu Lys Gly Gly Gln Phe Ser Leu His Ile Leu Asn His Ser

490

485 Thr Ile Val Ala Lys Pro Arg Val Phe

```
<210> 96
<211> 361
<212> PRT
<213> Lolium perenne
<400> 96
Met Gly Ile Val Asn Ala Ser Glu Lys Thr Ile Thr Gly Trp Ala Ala
                 10
Arg Asp Ala Thr Gly His Leu Ser Pro Tyr Thr Tyr Asn Leu Arg Arg
                   25
Thr Gly Ala Glu Asp Val Val Leu Lys Val Leu Tyr Cys Gly Ile Cys
                       40
                                      45
His Thr Asp Leu His Gln Thr Lys Asn His Leu Gly Ala Pro Lys Tyr
                  55
Pro Met Val Pro Gly His Glu Val Val Gly Glu Val Val Glu Val Gly
65 70
                                 75
Pro Glu Val Ser Lys Tyr Ser Val Gly Asp Val Val Gly Val 85 90 95
Ile Val Gly Cys Cys Arg Asp Cys Arg Pro Cys Lys Ala Asn Val Glu
        100 105 110
Gln Tyr Cys Asn Lys Lys Ile Trp Ser Tyr Asn Asp Val Tyr Thr Asp
115 120 125
Gly Lys Pro Thr Gln Gly Gly Phe Ala Ser Ser Met Val Val Asp Gln
 130 135 140
Lys Phe Val Val Lys Ile Pro Ala Gly Leu Ala Pro Glu Gln Ala Ala
                              155
145 150
Pro Leu Leu Cys Ala Gly Val Thr Val Tyr Ser Pro Leu Lys His Phe
            165 170 175
Gly Leu Met Thr Pro Gly Leu Arg Gly Gly Ile Leu Gly Leu Gly Gly 180 185 190
Val Gly His Met Gly Val Lys Val Ala Lys Ser Met Gly His His Val
195 200 205
Thr Val Ile Ser Ser Ser Asp Lys Lys Arg Ala Glu Ala Met Asp Asp
 210 215 220
Leu Gly Ala Asp Ala Tyr Leu Val Ser Ser Asp Glu Ala Gln Met Ala
225 230 235
Ala Ala Met Asp Ser Leu Asp Tyr Ile Ile Asp Thr Val Pro Val Lys
                             250 255
             245
His Pro Leu Glu Pro Tyr Leu Ala Leu Leu Lys Met Asp Gly Lys Leu
 260 265 270
Val Leu Met Gly Val Ile Gly Glu Pro Leu Ser Phe Val Ser Pro Met
 275 280 285
Val Met Leu Gly Arg Lys Thr Ile Thr Gly Ser Phe Ile Gly Ser Ile
  290 295 300
Glu Glu Thr Glu Glu Val Leu Arg Phe Cys Val Asp Lys Gly Leu Thr
                310 315 320
Ser Gln Ile Glu Val Val Lys Met Asp Tyr Leu Asn Gln Ala Leu Glu
                    330 335
            325
Arg Leu Glu Arg Asn Asp Val Arg Tyr Arg Phe Val Val Asp Val Ala 340 345 350
Gly Ser Asn Ile Asp Asp Thr Ala Ala
     355
<210> 97
<211> 361
<212> PRT
<213> Festuca arundinacea
<400> 97
Met Gly Ser Val Asp Ala Ser Glu Lys Thr Ile Thr Gly Trp Ala Ala 1 5 10 15
Arg Asp Thr Thr Gly His Leu Ser Pro Tyr Thr Tyr Thr Leu Arg Arg
   - 20
                         25
                                        30 ·
Thr Gly Ala Glu Asp Val Val Leu Lys Val Leu Tyr Cys Gly Ile Cys
```

WO 03/040306 PCT/NZ02/00239

His Thr Asp Leu His Gln Thr Lys Asn His Leu Gly Ala Ser Lys Tyr 55 Pro Met Val Pro Gly His Glu Val Val Gly Glu Val Val Gly 70 75 Pro Glu Val Ser Lys Tyr Ser Val Gly Asp Val Val Gly Val Gly Val Ile Val Gly Cys Cys His Asp Cys Arg Pro Cys Lys Ala Asn Val Glu 100 105 Gln Tyr Cys Asn Lys Lys Ile Trp Ser Tyr Asn Asp Val Tyr Thr Asp 115 120 125 Gly Lys Pro Thr Gln Gly Gly Phe Ala Ser Ala Met Val Val Asp Gln 135 - 140 Lys Phe Ala Val Lys Ile Pro Ala Gly Leu Ala Pro Glu Gln Ala Ala 145 150 155 Pro Leu Leu Cys Ala Gly Val Thr Val Tyr Ser Pro Leu Lys His Phe 170 165 Gly Leu Met Thr Pro Gly Leu Arg Gly Gly Ile Leu Gly Leu Gly Gly 180 185 190 Val Gly His Met Gly Val Lys Val Ala Lys Ser Met Gly His His Val 200 205 Thr Val Ile Ser Ser Ser Asn Lys Lys Arg Ala Glu Ala Met Asp Asp 215 220 Leu Gly Ala Asp Ala Tyr Leu Val Ser Ser Asp Glu Ala Gln Met Ala 235 225 230 Ala Ala Met Asp Ser Leu Asp Tyr Ile Ile Asp Thr Val Pro Val Lys 245 250 His Pro Leu Glu Pro Tyr Leu Ala Leu Leu Lys Met Asp Gly Lys Leu 265 270 260 Val Leu Met Gly Val Ile Ala Glu Pro Leu Ser Phe Val Ser Pro Met 280 285 Val Met Leu Gly Arg Lys Thr Ile Thr Gly Ser Phe Ile Gly Ser Ile 295 300 Glu Glu Thr Glu Glu Val Leu Arg Phe Cys Val Glu Lys Gly Leu Thr 305 310 315 Ser Gln Ile Glu Val Val Lys Met Asp Tyr Leu Asn His Ala Leu Glu 325 330 335 Arg Leu Glu Arg Asn Asp Val Arg Tyr Arg Phe Val Val Asp Val Ala 340 345 Gly Ser Asn Ile Lys Asp Ala Asp Ala

<210> 98

<211> 265

<212> PRT

<213> Lolium perenne

<400> 98

Met Ala Thr Thr Ala Ala Asp Ala Thr Ala Thr Val Ala Lys Glu Gln 5 1.0 Thr Thr Thr Asn Gly Ala Ala Ser Gly Ala Glu Gln Val Thr Arg His 20 25 Ser Glu Val Gly His Lys Ser Leu Leu Gln Ser Asp Ala Leu Tyr Gln 40 Tyr Ile Leu Glu Thr Thr Val Tyr Pro Arg Glu His Glu Cys Met Lys 55 60 Gln Leu Arg Glu Asp Thr Ala Asn His Pro Trp Asn Leu Met Thr Thr 75 70 Ser Ala Asp Glu Gly Gln Phe Leu Asn Leu Leu Ile Lys Leu Ile Gly 90 95 8.5 Ala Lys Lys Thr Met Glu Ile Gly Val Tyr Thr Gly Tyr Ser Leu Leu 110 105 Ala Thr Ala Leu Ala Ile Pro Glu Asp Gly Thr Ile Leu Ala Met Asp 120 125 Ile Asn Arg Glu Asn Tyr Glu Thr Ile Gly Lys Pro Cys Ile Glu Lys 1.35

```
Ala Gly Val Ala His Lys Ile Asp Phe Arg Glu Gly Pro Ala Leu Pro
                             1.55
        150
Val Leu Asp Glu Leu Leu Glu Asp Glu Ala Asn His Gly Thr Phe Asp
                   170 175
Phe Val Phe Val Asp Ala Asp Lys Asp Asn Tyr Leu Asn Tyr His Gln
                       185
                             190
      180
Arg Leu Met Lys Leu Val Arg Val Gly Gly Leu Leu Gly Tyr Asp Asn
   195
                    200 205
Thr Leu Trp Asn Gly Ser Val Val Leu Pro Ala Asp Ala Pro Met Arg
210 215 220
Lys Tyr Ile Arg Tyr Tyr Arg Asp Phe Val Leu Glu Leu Asn Lys Ala
                     235 240
            230
Leu Ala Ala Asp Asp Arg Val Glu Ile Cys Gln Leu Pro Val Gly Asp
       245 250
Gly Ile Thr Leu Cys Arg Arg Ala Lys
        260
<210> 99
<211> 265
<212> PRT
<213> Festuca arundinacea
<400> 99
Met Ala Thr Thr Ala Ala Asp Ala Thr Ala Thr Val Pro Lys Glu Gln
                          10
1
          5
Pro Ala Thr Asn Gly Ala Ala Ser Gly Ala Glu Gln Val Thr Arg His
         20
                        25
                                        30
Ser Glu Val Gly His Lys Ser Leu Leu Gln Ser Asp Ala Leu Tyr Gln
 35
            40
Tyr Ile Leu Glu Thr Thr Val Tyr Pro Arg Glu His Glu Cys Met Lys
 50 55 60
Gln Leu Arg Glu Asp Thr Ala Asn His Pro Trp Asn Leu Met Thr Thr
               70 75
Ser Ala Asp Glu Gly Gln Phe Leu Asn Leu Leu Ile Lys Leu Ile Gly
                           90 95
          85
Ala Lys Lys Thr Met Glu Ile Gly Val Tyr Thr Gly Tyr Ser Leu Leu
       100
                                        110
                        105
Ala Thr Ala Leu Ala Ile Pro Glu Asp Gly Thr Ile Leu Ala Met Asp
                                  125
      115 120
Ile Asn Arg Glu Asn Tyr Glu Thr Ile Gly Lys Pro Cys Ile Glu Lys
 130 135 140
Ala Gly Val Ala His Lys Ile Asp Phe Arg Glu Gly Pro Ala Leu Pro
             150
                              155 160
Val Leu Asp Glu Leu Leu Glu Asp Glu Ala Asn His Gly Ser Phe Asp
                         170
                                          175
            165
Phe Val Phe Val Asp Ala Asp Lys Asp Asn Tyr Leu Asn Tyr His Gln
                        185
                                      190
        180
Arg Leu Met Lys Leu Val Arg Val Gly Gly Leu Ile Gly Tyr Asp Asn
                     200
                                  205
    195
Thr Leu Trp Asn Gly Ser Val Val Leu Pro Ala Asp Ala Pro Met Arg
 210 215 220
Lys Tyr Ile Arg Tyr Tyr Arg Asp Phe Val Leu Glu Leu Asn Lys Ala 225 230 235
Leu Ala Ala Asp Asp Arg Val Glu Ile Cys Gln Leu Pro Val Gly Asp
 245 250
Gly Ile Thr Leu Cys Arg Arg Ala Lys
      260
<210> 100
<211> 363
<212> PRT
<213> Lolium perenne
<400> 100
Met Thr Val Val Glu Val Leu Ala Ala Gly Asp Ala Ala Ala Ala Ala
                            10
```

Val Ala Arg Pro Ala Gly Asn Gly Gln Thr Val Cys Val Thr Gly Ala 2.5 Ala Gly Tyr Ile Ala Ser Trp Leu Val Lys Leu Leu Leu Glu Lys Gly 40 Tyr Thr Val Lys Gly Thr Val Arg Asn Pro Asp Asp Pro Lys Asn Ala His Leu Arg Ala Leu Asp Gly Ala Ala Asp Arg Leu Val Leu Cys Lys 65 70 75 Ala Asp Leu Leu Asp Tyr Asp Ala Ile Arg Arg Ala Ile Asp Gly Cys 85 90 His Gly Val Phe His Thr Ala Ser Pro Val Thr Asp Asp Pro Glu Gln 100 105 110 Met Val Glu Pro Ala Val Arg Gly Thr Gln Tyr Val Ile Asp Ala Ala 125 120 Ala Glu Ala Gly Thr Val Arg Arg Met Val Leu Thr Ser Ser Ile Gly 135 140 Ala Val Thr Met His Pro Asn Arg Gly Pro Asp Val Val Val Asp Glu 150 155 Ser Cys Trp Ser Asp Leu Asp Phe Cys Lys Lys Thr Arg Asn Trp Tyr 165 170 175 Cys Tyr Gly Lys Ala Val Ala Glu Gln Ala Ala Ser Glu Leu Ala Arg 180 185 190 Gln Arg Gly Val Asp Leu Val Val Val Asn Pro Val Leu Val Ile Gly 195 200 205 Pro Leu Leu Gln Pro Thr Val Asn Ala Ser Ile Gly His Ile Leu Lys 210 215 220 Tyr Leu Asp Gly Ser Ala Ser Lys Phe Ala Asn Ala Val Gln Ala Tyr 230 235 240 Val Asp Val Arg Asp Val Ala Asp Ala His Leu Arg Val Phe Glu Cys 245 250 255 Ala Ala Ala Ser Gly Arg His Leu Cys Ala Glu Arg Val Leu His Arg 260 265 270 Glu Asp Val Val Arg Ile Leu Ala Lys Leu Phe Pro Glu Tyr Pro Val 275 280 Pro Thr Arg Cys Ser Asp Glu Ala Asn Pro Arg Lys Gln Pro Tyr Lys 295 300 Met Ser Asn Gln Lys Leu Gln Asp Leu Gly Leu Glu Phe Arg Pro Val 315 320 310 Ser Gln Ser Leu Tyr Glu Thr Val Lys Ser Leu Gln Glu Lys Gly His 325 330 . 335 Leu Pro Val Leu Ser Glu Gln Ala Glu Ala Asp Lys Glu Thr Leu Ala 340 345 Ala Glu Leu Gln Ala Gly Val Thr Ile Arg Ala 360 355

<210> 101

<211> 342

<212> PRT

<213> Festuca arundinacea

<400> 101

Met Thr Val Val Asp Ala Ala Ala Pro Gln Leu Pro Gly His Gly Gln 10 Thr Val Cys Val Thr Gly Ala Ala Gly Tyr Ile Ala Ser Gly Leu Val 25 Lys Leu Leu Glu Arg Gly Tyr Thr Val Lys Gly Thr Val Arg Asn 35 40 Pro Asp Asp Pro Lys Asn Ala His Leu Lys Ala Leu Asp Gly Ala Thr 60 55 Glu Arg Leu Ile Leu Cys Lys Ala Asp Leu Leu Asp Tyr Asp Ala Ile 65 70 75 80 70 Cys Ala Ala Val Glu Gly Cys His Gly Val Phe His Thr Ala Ser Pro 90 85 Val Thr Asp Asp Pro Glu Gln Met Val Glu Pro Ala Val Arg Gly Thr 100 105

```
Glu Tyr Val Ile Asn Ala Ala Ala Asp Ala Gly Thr Val Arg Arg Val
                     120
Val Phe Thr Ser Ser Ile Gly Ala Ile Thr Met Asp Pro Asn Arg Gly
                135
                                140
Pro Asp Val Val Val Asn Glu Ser Cys Trp Ser Asp Leu Glu Phe Cys
                             155
145 150
Lys Lys Thr Lys Asn Trp Tyr Cys Tyr Gly Lys Ala Val Ala Glu Gln
      165 170 175
Ala Ala Trp Glu Ala Ala Arg Lys Arg Gly Ile Asp Leu Val Val Val
        180 185 190
Asn Pro Val Leu Val Val Gly Pro Leu Leu Gln Pro Thr Val Asn Ala
                     200 205
Ser Ala Ala His Ile Leu Lys Tyr Leu Asp Gly Ser Ala Lys Lys Tyr
 210 215
                               220
Ala Asn Ala Val Gln Ser Tyr Val Asp Val Arg Asp Val Ala Gly Ala
225 230
                            235
His Ile Arg Val Phe Glu Ala Pro Glu Ala Ser Gly Arg Tyr Leu Cys
          245 250 255
Ala Glu Arg Val Leu His Arg Gly Asp Val Val Gln Ile Leu Ser Lys
       260 265 270
Leu Phe Pro Glu Tyr Pro Val Pro Thr Arg Cys Ser Asp Glu Val Asn
 275 280
                           285
Pro Arg Lys Gln Pro Tyr Lys Met Ser Asn Gln Lys Leu Gln Asp Leu
 290 295 300
Gly Leu Gln Phe Thr Pro Val Asn Asp Ser Leu Tyr Glu Thr Val Lys
305 310 315
Ser Leu Gln Glu Lys Gly His Leu Leu Val Pro Ser Lys Pro Glu Gly
                  330 335
          325
Leu Asn Gly Val Thr Ala
```

<210> 102

<211> 360

<212> PRT

<213> Festuca arundinacea

<400> 102

Met Gly Ser Thr Ala Ala Asp Met Ala Ala Ser Ala Asp Gln Glu Ala 5 10 15 Cys Met Phe Ala Leu Gln Leu Ala Ser Ser Ser Ile Leu Pro Met Thr 20 25 Leu Lys Asn Ala Ile Glu Leu Gly Leu Leu Glu Ile Leu Val Ala Ala 35 40 4.5 Gly Gly Lys Ser Leu Thr Pro Thr Glu Val Ala Ala Lys Leu Pro Ser 50 55 Ala Ala Asn Pro Glu Ala Pro Asp Met Val Asp Arg Met Leu Arg Leu 75 65 70 Leu Ala Ser Tyr Asn Val Val Thr Cys Leu Val Glu Glu Gly Lys Asp 90 85 Gly Arg Leu Ser Arg Ser Tyr Gly Ala Ala Pro Val Cys Lys Phe Leu 100 105 110 Thr Pro Asn Glu Asp Gly Val Ser Met Ala Ala Leu Ala Leu Met Asn 120 125 Gln Asp Lys Val Leu Met Glu Ser Trp Tyr Tyr Leu Lys Asp Ala Val 130 135 Leu Asp Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly Met Ser Ala Phe 150 155 Glu Tyr His Gly Thr Asp Pro Arg Phe Asn Arg Val Phe Asn Glu Gly 170 175 165 Met Lys Asn His Ser Ile Ile Ile Thr Lys Lys Leu Leu Glu Leu Tyr 180 185 His Gly Phe Gln Gly Leu Gly Thr Leu Val Asp Val Gly Gly Val 195 200 205 Gly Ala Thr Val Ala Ala Ile Ala Ala His Tyr Pro Ala Ile Lys Gly 215

Val Asn Phe Asp Leu Pro His Val Ile Ser Glu Ala Pro Gln Phe Pro 235 230 Gly Val Thr His Val Gly Gly Asp Met Phe Lys Glu Val Pro Ser Gly 250 245 Asp Ala Ile Leu Met Lys Trp Ile Leu His Asp Trp Ser Asp Gln His 260 265 Cys Ala Thr Leu Leu Lys Asn Cys Tyr Asp Ala Leu Pro Ala His Gly 275 280 Lys Val Val Leu Val Glu Cys Ile Leu Pro Val Asn Pro Glu Ala Lys 295 300 Pro Ser Ser Gln Gly Val Phe His Val Asp Met Ile Met Leu Ala His 310 315 Asn Pro Gly Gly Arg Glu Arg Tyr Glu Arg Glu Phe Glu Ala Leu Ala 325 330 335 Arg Gly Ala Gly Phe Thr Gly Val Lys Ser Thr Tyr Ile Tyr Ala Asn 340 345 350 Ala Trp Ala Ile Glu Phe Thr Lys 355 360 <210> 103 <211> 360 <212> PRT <213> FLolium perenne <400> 103 Met Gly Ser Thr Ala Ala Asp Met Ala Ala Ser Ala Asp Glu Asp Ala 10 5 Cys Met Phe Ala Leu Gln Leu Ala Ser Ser Ser Val Leu Pro Met Thr 25 20 Leu Lys Asn Ala Ile Glu Leu Gly Leu Leu Glu Ile Leu Val Ala Ala 4.5 35 · 40 Gly Gly Lys Ser Leu Thr Pro Thr Glu Val Ala Ala Lys Leu Pro Ser 60 50 55 Ala Ala Asn Pro Glu Ala Pro Asp Met Val Asp Arg Ile Leu Arg Leu 65 70 75 Leu Ala Ser Tyr Asn Val Val Thr Cys Leu Val Glu Glu Gly Lys Asp 85 90 Gly Arg Leu Ser Arg Ser Tyr Gly Ala Ala Pro Val Cys Lys Phe Leu 105 110 100 Thr Pro Asn Glu Asp Gly Val Ser Met Ala Ala Leu Ala Leu Met Asn 115 120 125 Gln Asp Lys Val Leu Met Glu Ser Trp Tyr Tyr Leu Lys Asp Ala Val 130 135 Leu Asp Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly Met Ser Ala Phe 150 155 Glu Tyr His Gly Thr Asp Pro Arg Phe Asn Arg Val Phe Asn Glu Gly 170 165 175 Met Lys Asn His Ser Ile Ile Ile Thr Lys Lys Leu Leu Glu Leu Tyr 190 185 His Gly Phe Glu Gly Leu Gly Ser Leu Val Asp Val Gly Gly Val 200 205 Gly Ala Thr Val Ala Ala Ile Ala Ala His Tyr Pro Thr Ile Lys Gly 210 215 220 Val Asn Phe Asp Leu Pro His Val Ile Ser Glu Ala Pro Gln Phe Pro 225 230 235 Gly Val Thr His Val Gly Gly Asp Met Phe Lys Glu Val Pro Ser Gly 250 255 245 Asp Ala Ile Leu Met Lys Trp Ile Leu His Asp Trp Ser Asp Gln His 270 260 265 Cys Ala Thr Leu Leu Lys Asn Cys Tyr Asp Ala Leu Pro Ala His Gly 275 280 285 Lys Val Val Leu Val Glu Cys Ile Leu Pro Val Asn Pro Glu Ala Asn

290 295 300

310

Pro Ser Ser Gln Gly Val Phe His Val Asp Met Ile Met Leu Ala His

<213> Lolium perenne

WO 03/040306 PCT/NZ02/00239 87

Asn Pro Gly Gly Arg Glu Arg Tyr Glu Arg Glu Phe Gln Ala Leu Ala 330 325 Arg Gly Ala Gly Phe Thr Gly Val Lys Ser Thr Tyr Ile Tyr Ala Asn 340 345 Ala Trp Ala Ile Glu Phe Thr Lys 355 360 <210> 104 <211> 360 <212> PRT <213> Festuca arundinacea <400> 104 Met Gly Ser Thr Ala Ala Asp Met Thr Ala Ser Ala Asp Glu Glu Ala 10 1 5 Cys Met Phe Ala Leu Gln Leu Ala Ser Ser Ser Ile Leu Pro Met Thr 20 25 Leu Lys Asn Ala Ile Glu Leu Gly Leu Leu Glu Ile Leu Val Ala Ala 35 40 Gly Gly Lys Ser Leu Thr Pro Thr Glu Val Ala Ala Lys Leu Pro Ser 60 50 55 Ala Ala Asn Pro Glu Ala Pro Asp Met Val Asp Arg Met Leu Arg Leu 75 65 70 Leu Ala Ser Tyr Asn Val Val Ser Cys Leu Val Glu Glu Gly Lys Asp 85 90 95 Gly Arg Leu Ser Arg Asn Tyr Gly Ala Ala Pro Val Cys Lys Phe Leu 100 105 Thr Pro Asn Glu Asp Gly Val Ser Met Ala Ala Leu Ala Leu Met Asn 120 125 115 Gln Asp Lys Val Leu Met Glu Ser Trp Tyr Tyr Leu Lys Asp Ala Val 130 135 140 Leu Asp Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly Met Ser Ala Phe 145 150 155 Glu Tyr His Gly Thr Asp Pro Arg Phe Asn Arg Val Phe Asn Glu Gly 165 170 Met Lys Asn His Ser Ile Ile Ile Thr Lys Lys Leu Leu Glu Leu Tyr 180 185 190 Asp Gly Phe Gln Gly Leu Gly Thr Leu Val Asp Val Gly Gly Gly Val 200 205 195 Gly Ala Thr Val Ala Ala Ile Thr Ala His Tyr Pro Ala Ile Lys Gly 210 215 220 Val Asn Phe Asp Leu Pro His Val Ile Ser Glu Ala Pro Pro Phe Pro 235 225 230 Gly Val Thr His Val Gly Gly Asp Met Phe Lys Lys Val Pro Ser Gly 245 250 Asp Ala Ile Met Met Lys Trp Ile Leu His Asp Trp Ser Asp Gln His 270 265 Cys Ala Thr Leu Leu Lys Asn Cys Tyr Asp Ala Leu Pro Ala His Gly 275 280 285 Lys Val Val Leu Val Glu Cys Ile Leu Pro Val Asn Pro Glu Ala Lys 290 295 300 Pro Ser Ser Gln Gly Val Phe His Val Asp Met Ile Met Leu Ala His 305 310 315 Asn Pro Gly Gly Arg Glu Arg Tyr Glu Arg Glu Phe Glu Ala Leu Ala 325 330 335 Arg Gly Ala Gly Phe Ala Gly Val Lys Ser Thr Tyr Ile Tyr Ala Asn 340 345 Ala Trp Ala Ile Glu Phe Thr Lys 355 360 <210> 105 <211> 361 <212> PRT

Met Gly Ser Thr Ala Ala Glu Ile Ala Ala Ser Ala Asp Glu Glu Ala

<400> 105

5

88

Cys Leu Tyr Ala Leu Gln Leu Gly Ser Ser Ser Ile Leu Pro Met Thr 25 2.0 Leu Lys Asn Thr Ile Glu Leu Gly Leu Leu Glu Thr Leu Met Ala Ala 4.5 40 Gly Gly Lys Ser Leu Thr Pro Thr Glu Val Ala Ala Lys Leu Pro Cys 50 55 60 Ala Ala Lys Asn Pro Glu Ala Pro Asp Met Val Asp Arg Met Leu Arg 65 70 75 Leu Leu Ala Ser Tyr Asn Leu Val Ser Cys Leu Val Glu Glu Gly Thr 85 90 Asp Gly Arg Leu Ser Arg Arg Tyr Gly Ala Ala Pro Val Cys Lys Phe 105 110 100 Leu Thr Pro Asn Glu Asp Gly Val Ser Met Ala Ala Leu Ala Leu Met 125 120 115 Asn Gln Asp Lys Val Leu Met Glu Ser Trp Tyr Tyr Leu Lys Asp Ala 130 135 140 Val Leu Asp Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly Met Ser Ala 150 155 Phe Glu Tyr His Gly Thr Asp Leu Arg Phe Asn Arg Val Phe Asn Glu 165 170 175 Ala Met Lys Asn Asn Ser Ile Ile Ile Thr Lys Lys Leu Leu Gln Leu 190 185 Tyr Asp Gly Phe Gln Gly Leu Gly Thr Leu Val Asp Val Gly Gly 195 200 205 Val Gly Ala Thr Val Ala Ala Ile Thr Ala His Tyr Pro Thr Ile Lys 210 215 220 Gly Ile Asn Phe Asp Leu Pro His Val Ile Ser Glu Ala Pro Pro Phe 230 235 Pro Gly Val Thr His Ile Gly Gly Asp Met Phe Lys Lys Val Pro Ser 250 255 245 Gly Asp Ala Ile Leu Met Lys Trp Ile Leu His Asp Trp Ser Asp Gln 265 270 260 His Cys Ala Thr Leu Leu Lys Asn Cys Tyr Asp Ala Leu Pro Val His 280 Gly Lys Val Val Leu Val Glu Cys Ile Leu Pro Val Asn Pro Glu Ala 300 290 295 Lys Pro Ser Ser Gln Gly Val Phe His Val Asp Met Ile Met Leu Ala 305 310 315 320 His Asn Pro Gly Gly Arg Glu Arg Tyr Glu Arg Glu Tyr Glu Ala Leu 330 335 325 Ala Arg Gly Ala Gly Phe Ala Gly Phe Lys Ser Thr Tyr Ile Tyr Ala 340 Asn Ala Trp Ala Ile Glu Phe Thr Lys 355 <210> 106 <211> 532 <212> PRT <213> Lolium perenne <400> 106 Met Val Gly Phe Ala Lys Ile Ala Met Glu Trp Ile Gln Asp Pro Leu 1.0 Ser Trp Leu Phe Ile Ala Ser Val Val Phe Val Val Leu Gln Arg Arg 30 2.0 25 Arg Arg Gly Asn Val Ala Pro Phe Pro Pro Gly Pro Lys Pro Leu Pro 40 45 3.5 Ile Val Gly Asn Met Ser Met Met Asp Gln Leu Thr His Arg Gly Leu 55 60 Ala Ala Leu Ala Lys Glu Tyr Gly Gly Leu Leu His Ile Arg Leu Gly 70 75 Lys Leu His Thr Phe Ala Val Ser Thr Pro Glu Tyr Ala Arg Glu Val

Leu Gln Val Gln Asp Gly Ala Phe Ser Asn Arg Pro Ala Thr Ile Ala

```
105
Ile Ala Tyr Leu Thr Tyr Asp Arg Ala Asp Met Ala Phe Ala His Tyr
                   120
                                  125
   115
Gly Pro Phe Trp Arg Gln Met Arg Lys Leu Cys Val Met Lys Leu Phe
                                140
  130 135
Ser Arg Arg Arg Pro Glu Thr Trp Leu Ala Val Arg Asp Glu Ser Ala
      150 155 160
Ala Leu Val Arg Ala Val Ala Arg Arg Thr Gly Glu Ser Val Asp Leu
         165 170 175
Gly Glu Leu Ile Phe Lys Leu Thr Lys Asn Val Ile Phe Arg Ala Ala
   180
                       185
                               190
Phe Gly Ala Gly Ala Val Ala Ala Asp Ala Glu Glu Gly Asp Gly Ala
     195 200
Gly Lys Gln Asp Glu Phe Ile Ala Ile Leu Gln Glu Phe Ser Lys Leu
  210 215 220
Phe Gly Ala Phe Asn Ile Gly Asp Phe Ile Pro Trp Leu Ser Trp Ala
                           235
       230
Asp Pro Gln Gly Ile Asn Val Arg Leu Arg Ala Ala Arg Asn Ala Leu
          245 250 255
Asp Glu Phe Ile Asp Lys Ile Ile Asp Glu His Met Glu Arg Gly Lys
  260 265
                              270
Asn Pro Asp Asp Ala Asp Ala Asp Met Val Asp Asp Met Leu Ala Phe
 275 280
Leu Pro Glu Ala Lys Pro Lys Lys Gly Ala Ala Gly Asp Gly Val Asp
                       300-
 290 295
Asp Leu Gln Asn Thr Leu Arg Leu Thr Arg Asp Asn Ile Lys Ala Ile
               310
                             315
Ile Met Asp Val Met Phe Gly Gly Thr Glu Thr Val Ala Ser Ala Ile
   325 330 335
Glu Trp Ala Met Ala Glu Met Met His Ser Pro Asp Asp Leu Arg Arg
 340 345 350
Leu Gln Glu Leu Val Asp Val Val Gly Leu Asp Arg Asn Val Asp
      355 360 365
Glu Ser Asp Leu Asp Lys Leu Pro Phe Leu Lys Cys Val Ile Lys Glu
                 375
                                380
Thr Leu Arg Leu His Pro Pro Ile Pro Leu Leu Leu His Glu Thr Ala
                              395
               390
Glu Asp Cys Val Val Gly Gly Tyr Ser Val Pro Arg Gly Ser Arg Val
         405 410 415
Met Ile Asn Val Tyr Ala Ile Gly Arg Asp Arg Arg Ala Trp Lys Asp
        420 425 430
Ala Asp Val Phe Arg Pro Ser Arg Phe Val Gln Gly Glu Gly Glu Ala
     435 440 445
Ala Gly Leu Asp Phe Lys Gly Gly Cys Phe Glu Phe Leu Pro Phe Gly
                                460
                455
Ser Gly Arg Arg Ser Cys Pro Gly Met Ala Leu Gly Leu Tyr Ala Leu
             470
                             475
Glu Leu Ala Val Ala Gln Leu Ala His Gly Phe Ser Trp Glu Leu Pro
          485 490 495
Asp Gly Met Lys Pro Ser Glu Leu Asp Met Ser Asp Val Phe Gly Leu
   500 505 510
Thr Ala Pro Arg Ala Thr Arg Leu Phe Ala Val Pro Thr Pro Arg Leu
    515 . 520
Ala Cys Thr Gln
530
<210> 107
<211> 542
<212> PRT
<213> Festuca arundinacea
<400> 107
Met Val Gly Phe Ala Lys Ile Ala Met Glu Trp Leu Gln Glu Pro Leu
                           10
```

Ser Trp Leu Phe Ile Ala Ser Val Val Phe Val Val Leu Gln Arg Arg Arg Arg Gly Asn Val Ala Pro Phe Pro Pro Gly Pro Lys Pro Leu Pro 35 40 Ile Val Gly Asn Met Ser Met Met Asp Gln Leu Thr His Arg Gly Leu 55 60 Ala Ala Leu Ala Lys Glu Tyr Gly Gly Leu Leu His Ile Arg Leu Gly 75 Lys Leu His Ala Phe Ala Val Ser Thr Pro Glu Tyr Ala Arg Glu Val 90 95 Leu Gln Val Gln Asp Gly Ala Phe Ser Asn Arg Pro Ala Thr Ile Ala 100 105 Ile Ala Tyr Leu Thr Tyr Asp Arg Ala Asp Met Ala Phe Ala His Tyr 120 125 115 Gly Pro Phe Trp Arg Gln Met Arg Lys Leu Cys Val Met Lys Leu Phe 140 135 Ser Arg Arg Arg Pro Glu Thr Trp Leu Ala Val Arg Asp Glu Ser Ala 155 150 Ala Leu Val Arg Ala Val Ala Arg Arg Ser Gly Glu Ser Val Asp Leu 165 170 Gly Glu Leu Ile Phe Lys Leu Thr Lys Asn Val Ile Phe Arg Ala Ala 180 185 Phe Gly Ala Gly Ala Val Ala Gly Asp Gly Asp Gly Asp Gly Ala Gly 200 205 Lys Gln Asp Glu Phe Ile Ala Ile Leu Gln Glu Phe Ser Lys Leu Phe 220 215 Gly Ala Phe Asn Ile Gly Asp Phe Ile Pro Trp Leu Ser Trp Ala Asp 235 225 230 Pro Gln Gly Ile Asn Val Arg Leu Arg Ala Ala Arg Ala Ala Leu Asp 250 245 Glu Phe Ile Asp Lys Ile Ile Asp Glu His Met Glu Arg Gly Lys Asn 265 270 260 Pro Asp Asp Ala Asp Ala Asp Met Val Asp Asp Met Leu Ala Phe Leu 280 Pro Glu Thr Lys Pro Lys Lys Gly Ala Ala Gly Asp Gly Val Asp Asp 300 295 Leu Gln Asn Thr Leu Arg Leu Thr Arg Asp Asn Ile Lys Ala Ile Ile 310 315 Met Asp Val Met Phe Gly Gly Thr Glu Thr Val Ala Ser Ala Ile Glu 330 335 325 Trp Ala Met Ala Glu Met Met His Ser Pro Gly Asp Leu Arg Arg Leu 340 345 Gln Gln Glu Leu Ala Asp Val Val Gly Leu Asp Arg Asn Val Asp Glu 365 360 Ser Asp Leu Asp Lys Leu Pro Phe Leu Lys Cys Val Ile Lys Glu Thr 380 375 Leu Arg Leu His Pro Pro Ile Pro Leu Leu Leu His Glu Thr Ala Glu 395 390 Asp Cys Ile Val Gly Gly Tyr Ser Val Pro Arg Gly Ser Arg Val Met 410 415 405 Ile Asn Val Tyr Ala Ile Gly Arg Asp Arg Lys Ala Trp Lys Asp Ala 430 425 Asp Val Phe Arg Pro Ser Arg Phe Val Gln Gly Glu Gly Glu Ala Ala 440 445 Gly Leu Asp Phe Lys Gly Gly Cys Phe Glu Phe Leu Pro Phe Gly Ser 450 455 Gly Arg Arg Ser Cys Pro Gly Met Ala Leu Gly Leu Tyr Ala Leu Glu 475 470 Leu Ala Val Ala Gln Leu Ala His Gly Phe Ser Trp Glu Leu Pro Asp 490 485 Gly Met Lys Pro Ser Glu Leu Asp Met Ser Asp Val Phe Gly Leu Thr 510 505 Ala Pro Arg Ala Thr Arg Leu Phe Ala Val Pro Thr Pro Arg Leu Ala 525 515 520 Cys Thr Gln Leu Leu Gly Ala Asp Asp Ala Gly Arg Gln Ala 535

<210> 108

<211> 711 <212> PRT <213> Lolium perenne <400> 108 Met Glu Ser Glu Asn Val Ala Ala Asn Gly Asp Gly Leu Cys Val Ala 5 Gln Pro Ala Arg Ala Asp Pro Leu Asn Trp Gly Lys Ala Ala Glu Glu 25 Leu Ser Gly Ser His Leu Asp Ala Val Lys Arg Met Val Glu Glu Tyr 40 45 Arg Arg Pro Val Val Thr Met Glu Gly Ala Ser Leu Thr Ile Ala Met 60 Val Ala Ala Val Ala Ala Gly Ala Asp Thr Arg Val Glu Leu Asp Glu 70 Ser Ala Arg Gly Arg Val Lys Glu Ser Ser Asp Trp Val Met Asn Ser 8.5 90 Met Ala Asn Gly Thr Asp Ser Tyr Gly Val Thr Thr Gly Phe Gly Ala 100 105 Thr Ser His Arg Arg Thr Lys Glu Gly Gly Ala Leu Gln Arg Glu Leu 120 125 Ile Arg Phe Leu Asn Ala Gly Ala Phe Gly Thr Gly Ser Asp Gly His 130 135 140 Val Leu Pro Ala Ala Thr Thr Arg Ala Ala Met Leu Val Arg Val Asn 145 150 155 Thr Leu Leu Gln Gly Tyr Ser Gly Ile Arg Phe Glu Ile Leu Glu Thr 170 175 165 Val Ala Thr Leu Leu Asn Ala Asn Val Thr Pro Cys Leu Pro Leu Arg 180 185 190 Gly Thr Ile Thr Ala Ser Gly Asp Leu Val Pro Leu Ser Tyr Ile Ala 195 200 205 195 Gly Leu Val Thr Gly Arg Pro Asn Ser Val Ala Thr Ala Pro Asp Gly . 210 215 Thr Lys Val Asn Ala Ala Glu Ala Phe Lys Ile Ala Gly Ile Gln His 230 235 Gly Phe Phe Glu Leu Gln Pro Lys Glu Gly Leu Ala Met Val Asn Gly 250 255 245 Thr Ala Val Gly Ser Gly Leu Ala Ser Met Val Leu Phe Glu Ala Asn 265 270 260 Ile Leu Gly Ile Leu Ala Glu Val Leu Ser Ala Val Phe Cys Glu Val 27⁻5 285 280 Met Asn Gly Lys Pro Glu Tyr Thr Asp His Leu Thr His Lys Leu Lys 295 His His Pro Gly Gln Ile Glu Ala Ala Ala Ile Met Glu His Ile Leu 315 310 Glu Gly Ser Ser Tyr Met Met Leu Ala Lys Lys Leu Gly Glu Leu Asp 325 330 Pro Leu Met Lys Pro Lys Gln Asp Arg Tyr Ala Leu Arg Thr Ser Pro 345 350 340 Gln Trp Leu Gly Pro Gln Ile Glu Val Ile Arg Ala Ala Thr Lys Ser 365 360 Ile Glu Arg Glu Ile Asn Ser Val Asn Asp Asn Pro Leu Ile Asp Val 375 Ser Arg Gly Lys Ala Ile His Gly Gly Asn Phe Gln Gly Thr Pro Ile 395 390 Gly Val Ser Met Asp Asn Thr Arg Leu Ala Ile Ala Ala Ile Gly Lys 405 410 Leu Met Phe Ala Gln Phe Ser Glu Leu Val Asn Asp Phe Tyr Asn Asn 425 430 420 Gly Leu Pro Ser Asn Leu Ser Gly Gly Arg Asn Pro Ser Leu Asp Tyr 435 440 Gly Phe Lys Gly Ala Glu Ile Ala Met Ala Ser Tyr Cys Ser Glu Leu 455

PCT/NZ02/00239

Gln Phe Leu Gly Asn Pro Val Thr Asn His Val Gln Ser Ala Glu Gln 470 475 His Asn Gln Asp Val Asn Ser Leu Gly Leu Ile Ser Ala Arg Lys Thr 485 490 Ser Glu Ala Ile Asp Ile Leu Lys Leu Met Ser Ser Thr Phe Leu Val 500 505 510 Ala Leu Cys Gln Ala Ile Asp Leu Arg His Leu Glu Glu Asn Val Lys 515 520 525 Asn Ala Val Lys Asn Cys Val Lys Met Val Ala Arg Lys Thr Leu Ser 530 535 540 Thr Asn Asp Ser Gly His Leu His Ser Ala Arg Phe Cys Glu Lys Asp 550 555 Leu Leu Thr Ile Asp Arg Glu Ala Val Phe Ala Tyr Ala Asp Asp 565 570 Pro Cys Ser Ala Asn Tyr Pro Leu Met Gln Lys Met Arg Ala Val Leu 580 585 590 Val Glu His Ala Leu Ala Asn Gly Glu Ala Glu Arg Asp Val Gln Thr 60.5 600 Ser Val Phe Ala Lys Leu Ala Ala Phe Glu Gln Glu Leu Arg Ala Val 610 615 620 Leu Pro Arg Glu Val Glu Ser Ala Arg Cys Ala Val Glu Asn Gly Thr 625 630 635 Ala Ala Gln Gln Asn Arg Ile Thr Glu Cys Arg Ser Tyr Pro Leu Tyr 645 650 655 Arg Phe Val Arg Lys Glu Leu Gly Thr Glu Tyr Leu Thr Gly Glu Lys 665 670 660 Thr Arg Ser Pro Gly Glu Glu Val Asp Lys Val Phe Val Ala Met Asn 680 685 Gln Gly Lys His Ile Asp Ala Leu Leu Glu Cys Leu Lys Glu Trp Asn 690 695 Gly Glu Pro Leu Pro Ile Cys <210> 109 <211> 713 <212> PRT

<213> Festuca arundinacea

<400> 109

Met Glu Cys Glu Asn Gly His Val Ala Ala Asn Gly Asp Gly Leu Cys 10 15 Val Ala Gln Pro Ala Arg Ala Asp Pro Leu Asn Trp Gly Lys Ala Ala 30 20 25 Glu Glu Leu Ser Gly Ser His Leu Asp Ala Val Lys Arg Met Val Glu 4 0 Glu Tyr Arg Arg Pro Val Val Thr Met Glu Gly Ala Ser Leu Thr Ile 60 55 Ala Met Val Ala Ala Val Ala Ala Gly Ala Asp Thr Arg Val Glu Leu 75 80 70 Asp Glu Ser Ala Arg Gly Arg Val Lys Glu Ser Ser Asp Trp Val Met 90 Asn Ser Met Ala Asn Gly Thr Asp Ser Tyr Gly Val Thr Thr Gly Phe 100 105 Gly Ala Thr Ser His Arg Arg Thr Lys Glu Gly Gly Ala Leu Gln Arg 115 120 125 Glu Leu Ile Arg Phe Leu Asn Ala Gly Ala Phe Gly Thr Gly Ser Asp 135 140 Gly His Val Leu Pro Ala Ala Thr Thr Arg Ala Ala Met Leu Val Arg 155 150 Val Asn Thr Leu Leu Gln Gly Tyr Ser Gly Ile Arg Phe Glu Ile Leu 165 170 175 Glu Thr Ile Ala Thr Leu Leu Asn Ala Asn Val Thr Pro Cys Leu Pro 180 185 190 Tyr Arg Gly Thr Ile Thr Ala Ser Gly Asp Leu Val Pro Leu Ser Tyr 195 200

Ile		Gly	Leu	Val	Thr	Gly 215	Arg	Pro	Asn	Ser	Val 220	Ala	Thr	Ala	Pro
Asp 225	210 Gly	Ser	Lys	Val	Asn 230		Ala	Glu	Ala	Phe 235		Ile	Ala	Gly	Ile 240
	His	Gly	Phe	Phe 245		Leu	Gln	Pro	Lys 250		Gly	Leu	Ala	Met 255	Val
		Thr	260					265					270		
		Ile 275					280					285			
	290	Met				295					300				
305		His			310					315					320
		Glu		325					330					335	
	_	Pro	340					345					350		
		Gln 355					360					365			
_	370	Ile Ser				375					380				
385		Ser			390					395					400
		Leu		405					410					415	
		Gly	420					425					430		
		435 Gly					440					445			
	450	Gln				455					460				
465		His			470					475					480
		Ala		485					490					495	
		Ala	500					505					510		
		515 Asn					520					525			
	530	Thr				535					540				
545		Leu			550					555					560
		Pro		565				Pro	570 Leu				Met	575 Arg	
Val	Leu	. Val	580 Glu		Ala	Leu				Glu	Ala				Val
Gln				Phe	Ala				Thr	Phe				Leu	Arg
			Pro	Lys				Ser	Ala				Val	Glu	Asn
625 Gly	Thr	Ala	Ala				Arg	Ile	Ser 650			Arg	Ser	Tyr 655	640 Pro
Leu	тух	Arg				Lys	Glu	Leu 665	Gly		Glu	Туг	Leu 670	Thr	Gly
Glu	Lys	Thr 675			Pro	Gly	Glu 680	Glu		Asp	Lys	Val 685	Phe		Ala
Met	Asn 690	Glr		Lys	His	: Ile 695	a Asp		Leu	Leu	. Glu	Cys		Lys	Glu
Trp 705	Asn	Gly	glu	Pro	Leu 710	Pro		е Суз	i						

WO 03/040306 PCT/NZ02/00239

```
<210> 110
<211> 323
<212> PRT
<213> Festuca arundinacea
<400> 110
Met Ala Phe Ser Gly Ser Val Ser Gly Val Val Leu Val Val Ala Ile
                            1.0
Leu Leu Leu Gly Leu Ala Ala Ala Ala Ser Ala Gln Leu Ser Ala Thr
             25
Phe Tyr Asp Ala Ser Cys Pro Ser Ala Leu Ala Thr Ile Lys Ser Ala
         40
                                      45
35
Val Thr Ala Ala Val Asn Asn Glu Ala Arg Met Gly Ala Ser Leu Leu
 50 55
Arg Leu His Phe His Asp Cys Phe Val Gln Gly Cys Asp Ala Ser Val
             70
                    75
Leu Leu Asn Asp Thr Ala Asn Phe Thr Gly Glu Gln Thr Ala Phe Pro
                          90
Asn Arg Asn Ser Ile Arg Gly Leu Asn Val Ile Asp Asn Val Lys Ala
       100 105
                                 110
Gln Val Glu Ala Val Cys Thr Gln Thr Val Ser Cys Ala Asp Ile Leu
 115 120
Ala Val Ala Ala Arg Asp Ser Ile Val Ala Leu Gly Gly Pro Ser Tyr
  130 135 140
Thr Val Pro Leu Gly Arg Arg Asp Ser Thr Thr Ala Ser Leu Ser Glu
              150 155 160
Ala Asn Arg Asp Leu Pro Pro Pro Ser Ser Asp Leu Ala Asp Leu Val
                             170
            165
Gly Asn Phe Ser Arg Lys Gly Leu Ser Val Thr Asp Met Val Ala Leu
       180 185 190
Ser Gly Ala His Thr Ile Gly Arg Ala Ala Cys Leu Asn Phe Arg Ser
195 200 205
Arg Ile Tyr Gly Glu Ser Asn Ile Ala Pro Ala Tyr Ala Ala Ser Leu
  210 215
                                 220
Gln Ala Asn Cys Pro Gln Ser Ala Pro Asn Gly Asp Gly Thr Leu Ala
                               235 240
              230
Pro Leu Asp Val Ser Thr Pro Asp Ala Phe Asp Asn Ala Tyr Tyr Gly
                           250
                                          255
            245
Asn Leu Leu Ser Gln Gln Gly Leu Leu His Ser Asp Gln Gln Leu Phe
       260 265 270
Asn Gly Gly Ser Thr Asp Ser Leu Val Ser Thr Tyr Ala Ser Asn Ala
     275 280
Ala Gln Phe Ser Gly Asp Phe Ala Ala Ala Met Val Asn Met Gly Asn
 290 295 300
Ile Gly Val Leu Thr Gly Ala Gln Gly Glu Ile Arg Leu Asn Cys Gly
              310
Lys Val Asn
<210> 111
<211> 344
<212> PRT
<213> Lolium perenne
<400> 111
Met Ala Ser Ser Ser Pro Phe Ser Arg Val Ser Gln Leu Ala Val
                            10
 1
Lys Ala Thr Val Leu Ala Ala Val Cys Leu Leu His Gly Gly Gly
                          25
       20
Gly Ser Ser Ala Ser Ala Ala Glu Leu Cys Val Ser Tyr Tyr Asp His
 35
                 40
Thr Cys Pro Asp Ala Tyr Lys Ile Val Gln Gly Val Leu Val Glu Ala
                                60
 50 55
His Lys Ser Asp Pro Arg Ile Phe Ala Ser Leu Ile Arg Leu His Phe
```

His Asp Cys Phe Val Leu Gly Cys Asp Gly Ser Leu Leu Asp Thr 90 Phe Pro Gly Phe Gln Ser Glu Lys Asp Ala Arg Pro Asn Asn Asn Ser 105 Ala Arg Gly Tyr Pro Val Val Asp Ala Ala Lys Ala Ala Leu Glu Lys 125 115 120 Ala Cys Pro Gly Val Val Ser Cys Ala Asp Ile Leu Ala Leu Ala Ala 135 140 Glu Ile Ser Val Gln Leu Ser Gly Gly Pro Gly Trp Gly Val Leu Leu 145 150 155 160 Gly Arg Leu Asp Gly Lys Thr Ser Ser Ile Ala Gly Ala Gln Asn Leu 165 170 Pro Gly Pro Phe Asp Gly Leu Lys Asn Leu Thr Leu Lys Phe Gln Ala 180 185 190 Val Asn Leu Asp Val Thr Asp Leu Val Ala Leu Ser Gly Ala His Thr 200 205 Phe Gly Arg Val Lys Cys Arg Phe Val Thr Asn Arg Leu Tyr Asn Phe 215 220 Ser Gly Thr Asn Gln Pro Asp Pro Thr Leu Asn Ala Ala Tyr Arg Ala 225 230 235 Phe Leu Ser Thr Arg Cys Pro Arg Asn Gly Asp Ala Asn Ser Leu Asn 245 250 255 Asp Leu Asp Pro Thr Thr Pro Asp Thr Phe Asp Lys Asn Tyr Phe Thr 260 265 270 . Asn Leu Glu Lys Asn Arg Gly Phe Leu Asp Ser Asp Gln Gln Leu Lys 275 280 285 Ser Asp Pro Gly Ala Leu Thr Thr Thr Ala Pro Ile Val Asp Arg Phe 290 295 300 Ala Şer Ser Gln Asp Ala Phe Phe Lys Ser Phe Ala Trp Ser Met Ile 305 310 315 320 Lys Met Gly Asn Ile Leu Pro Ile Thr Asp Pro Ser Arg Gly Glu Val 325 330 Arg Lys His Cys Ala Phe Val Asn 340 <210> 112 <211> 326 <212> PRT <213> Festuca arundinacea <400> 112 Met Ala Thr Arg Gly Val Met Val Ala Leu Leu Leu Ala Ala Val Ala 10 15 1 5 Ala Ser Cys Ala His Ala Gln Leu His Glu Lys Phe Tyr Ser Glu Ser 2.5 20 Cys Pro Ser Val Glu Asp Val Val Arg Lys Glu Met Val Met Ala Leu 4.5 40 Ser Leu Ala Pro Ser Leu Ala Ala Pro Leu Leu Arg Met His Phe His 60 Asp Cys Phe Val Arg Gly Cys Asp Gly Ser Val Leu Leu Asp Ser Ala 75 80 70 Asn Lys Thr Ala Glu Lys Asp Ala Leu Pro Asn Gln Thr Leu Arg Gly 90

85 Phe Asp Phe Val Glu Arg Val Lys Ala Ala Val Glu Lys Ala Cys Pro 105 110 100 Asp Thr Val Ser Cys Ala Asp Val Val Thr Leu Ile Ala Arg Asp Ala 120 125 Val Trp Leu Ser Lys Gly Pro Phe Trp Glu Val Pro Leu Gly Arg Arg 135 140 Asp Gly Ser Val Ser Ile Ser Asn Glu Thr Asp Ala Leu Pro Pro 145 150 155 160 Thr Ala Asn Ile Thr Val Leu Thr Gln Leu Phe Ala Ala Lys Asn Leu 165 170 175 Asp Ile Lys Asp Leu Val Val Leu Ser Ala Ala His Thr Ile Gly Thr 185 180

```
Ser His Cys Phe Ser Phe Ser Asp Arg Leu Tyr Asn Phe Thr Gly Leu
                     200
 195
Asp Asn Ala Ser Asp Ile Asp Pro Thr Leu Glu Pro Phe Tyr Met Ala
  210 215
                               220
Lys Leu Lys Ser Lys Cys Thr Ser Leu Asp Asp Asn Ser Thr Leu Val
              230 235
Glu Met Asp Pro Gly Ser Phe Lys Thr Phe Asp Leu Asp Tyr Phe Lys
            245
                   250
                                 255
Leu Val Ser Lys Arg Arg Gly Leu Phe His Ser Asp Gly Ala Leu Leu
   260 265 270
Thr Asp Ala Phe Thr Arg Ala Tyr Ile Leu Arg His Ala Thr Gly Ala
 275 280
Phe Lvs Asp Glu Phe Phe Ala Asp Phe Ala Val Ser Met Val Lys Met
 290 295 300
Gly Asn Thr Asp Val Leu Thr Gly Ser Gln Gly Glu Ile Arg Lys Lys
305 310
                     315
Cys Ser Val Val Asn His
<210> 113
<211> 358
<212> PRT
<213> Lolium perenne
<400> 113
Met Ala Ser Ser Arg Val Leu Leu Val Val Ala Ala Leu Ala Ile
            5
                           10
Ser Val Ser Ala Thr Ala Ala Ala Thr Lys Ile Ser Ala Pro Leu Pro
                                     30
                        25
         20
Pro Leu Ala Lys Gly Leu Asn Phe Asp Phe Tyr Lys Ala Thr Cys Pro
                                    45
 35
                    40
Gln Ala Glu Ser Ile Val Phe Asn Phe Leu Arg Asp Ala Ile Arg Lys
 50 55
                               60
Asp Val Gly Leu Ala Ala Ala Leu Leu Arg Ile His Phe His Asp Cys
             70 75
Phe Val Gln Gly Cys Asp Gly Ser Val Leu Leu Asp Lys Thr Gly Gly
                           90
           85
Thr Asp Ser Glu Lys Ile Ala Pro Pro Asn Val Thr Leu Arg Pro Thr
        100
                        105 110
Ala Phe Lys Ala Ile Asn Asp Leu Arg Ala Leu Leu Ala Lys Ala Cys
 115 120 125
Gly Ala Val Val Ser Cys Ala Asp Ile Ala Ala Leu Ala Ala Arg Asp
 130 135 140
Ser Val His Leu Ala Gly Gly Pro His Tyr Pro Val Pro Leu Gly Arg
              150 155
Arg Asp Gly Leu Ala Pro Ala Asn Leu Thr Thr Ile Leu Asn Ala Leu
                           170 175
Pro Ala Pro Ser Ser Asn Val Thr Thr Leu Leu Arg Phe Leu Ala Lys
                        185
                                     190
        180
Ile Ser Leu Asp Ala Asn Asp Leu Val Ala Leu Ser Gly Ala His Thr
 195 200 205
Leu Gly Ile Ala His Cys Thr Ser Phe Gln Glu Arg Leu Phe Pro Gln
        215 220
Asn Asp Val Thr Leu Asn Lys Trp Phe Ala Ser Gln Leu Arg Leu Thr
               230 235 240
Cys Pro Ala Leu Asn Thr Asp Asn Thr Thr Asn Asn Asp Ile Arg Thr
                          250
                                          255
Pro Asn Val Phe Asp Asn Lys Tyr Tyr Val Asp Leu Leu Asn Arg Gln
                      265
        260
Gly Leu Phe Thr Ser Asp Gln Asp Leu His Thr Asp Ala Arg Thr Lys
    275
                     280
                            285
Pro Thr Val Thr Arg Phe Ala Val Asp Gln Ala Ala Phe Phe Asp Gln
 290 295
                         300
Phe Val Phe Ser Val Val Lys Met Gly Gln Ile Asn Val Leu Thr Gly
               310
                      315
```

```
Ser Gln Gly Gln Ile Arg Asn Asp Cys Ser Ala Pro Asn Lys Gly Arg
            325 330 335
Thr Asn Asp Asp Leu Pro Trp Ser Val Leu Glu Thr Val Thr Glu Ala
         340 345
Ala Gln Ser Leu Val Leu
 355
<210> 114
<211> 344
<212> PRT
<213> Lolium perenne
<400> 114
Met Thr Thr Met Gly Gly Ser Ser Ile Leu Pro Ala Pro Thr Val Ala
                             10
Thr Thr Ala Leu Val Leu Leu Ile Val Leu Phe Ala Ser Pro Ala Thr
   20
                          25
Val Ala Lys Gly Ser Gly Leu Ser Val Gly Phe Tyr Lys Lys Leu Cys
                   40
Pro Lys Ala Glu Lys Val Val Arg Arg Thr Val Thr Lys Ala Phe Glu
                           60
 50 55
Lys Glu Pro Gly Thr Pro Ala Asp Ile Ile Arg Leu Phe Phe His Asp 65 70 75 80
Cys Phe Val Arg Gly Cys Asp Ala Ser Val Leu Leu Glu Ser Thr Pro
            85 90
Gly Arg Met Ala Glu Arg Asp Ser Lys Ala Asn Asn Pro Ser Leu Asp
        100
                        105
                                           110
Gly Phe Glu Val Ile Ser Asp Ala Lys Glu Thr Leu Glu Lys Leu Cys
    115 120 125
Pro Gln Thr Val Ser Cys Ala Asp Ile Leu Ala Leu Ala Ala Arg Asp 130 135 140
Gly Ala Tyr Leu Ala Ser Gly Leu Asp Tyr Ala Val Pro Thr Gly Arg
145 150 155 160
Arg Asp Gly Leu Val Ser Lys Glu Asp Glu Val Leu Pro Ser Val Pro
   165 170 175
His Pro Asp Phe Asn His Ser Gln Leu Val Glu Asn Phe Thr Ala Lys
         180 185 190
Gly Phe Thr Ala Glu Glu Met Val Thr Leu Ser Gly Ala His Thr Ile
    195 200 205
Gly Thr Ser His Cys Ser Ser Phe Thr Asp Arg Leu Tyr Asn Phe Ser 210 215 220
Gln Gly Gly Ala Leu Thr Thr Asp Pro Ala Leu Pro Ala Ala Tyr Ala
225 230 235 240
225 230
Ala Leu Leu Lys Glu Lys Cys Pro Pro Glu Thr Ala Ala Gln Asn Asp
             245
                              250
Thr Thr Met Val Gln Leu Asp Asp Val Thr Pro Phe Val Met Asp Asn
                          265
                               270
   260
Gln Tyr Tyr Lys Asn Leu Leu Ala Gly Thr Val Pro Leu Gly Ser Asp
           280 285
Val Ala Leu Met Glu Ser Pro Asp Thr Ala Ala Leu Val Glu Leu Tyr
  290 295 300
Ala Arg Glu Pro Ala Glu Tyr Trp Ala Lys Arg Phe Val Ala Ala Met
305 310 315 320
Val Lys Val Ser Glu Met Glu Val Leu Thr Gly Ala Glu Gly Glu Ile
                             330
     325
Arg Leu Asn Cys Ser Lys Val Asn
          340
<210> 115
<211> 293
<212> PRT
<213> Lolium perenne
<400> 115
Thr Arg Glu Asn Tyr Tyr Gly Ser Ser Cys Pro Thr Ala Leu Leu Thr
```

Ile Arg Thr Val Val Thr Thr Ala Val Leu Leu Asp His Arg Met Gly 25 Ala Ser Leu Leu Arg Leu His Phe His Asp Cys Phe Val Gln Gly Cys 45 40 Asp Ala Ser Val Leu Leu Asp Asp Thr Ala Gly Phe Thr Gly Glu Lys 50 55 Gly Ala Gly Pro Asn Ala Gly Ser Leu Arg Gly Leu Glu Val Ile Asp 70 75 Lys Ile Lys Met Leu Leu Glu Phe Met Cys Pro Arg Thr Val Ser Cys 85 90 95 Ala Asp Ile Leu Ala Val Ala Ala Arg Asp Ser Val Val Arg Leu Gly 110 100 105 Gly Pro Ser Trp Ala Val Gln Leu Gly Arg Arg Asp Ala Thr Thr Ala 115 120 125 Ser Ala Ser Leu Ala Ser Ser Asp Leu Pro Gly Pro Asn Ser Asn Leu 130 135 140 Asn Asp Leu Leu Thr Ala Phe Ser Lys Lys Gly Leu Ser Thr Thr Asp 145 150 155 Met Val Ala Leu Ser Gly Ala His Thr Ile Gly Arg Ala Gln Cys Gln 165 170 175 Asn Tyr Arg Asn Arg Ile Tyr Thr Asp Thr Asp Ile Asp Gly Ala Phe 185 190 180 Ala Ala Ser Leu Arg Gly Gly Cys Pro Gln Ala Gly Gly Asp Gly Asn 195 200 205 Leu Ala Pro Leu Asp Ala Ser Ser Pro Asn Thr Phe Asp Asn Gly Tyr 210 215 220 Phe Ser Gly Leu Leu Ser Arg Gln Gly Leu Leu His Ser Asp Gln Ala 235 240 230 Leu Tyr Asp Gly Gly Ser Thr Asp Asp Leu Val Arg Thr Tyr Ala Ser 245 250 255 Asn Asn Asp Gln Phe Gly Ser Asp Phe Ala Ala Ala Met Val Lys Leu 260 265 270 Ser Asn Ile Gly Leu Leu Thr Gly Ser Ser Gly Glu Ile Arg Val Asn 280 275 Cys Arg Ala Val Asn 290

<210> 116

<211> 311

<212> PRT

<213> Festuca arundinacea

<400> 116

Met Ala Ser Ala Ser Cys Ile Ser Leu Val Leu Leu Val Ala Leu Ala 1 5 10 Ala Thr Ala Ala Ser Ala Gln Leu Ser Ser Thr Phe Tyr Asp Thr Ser 20 25 Cys Pro Arg Ala Leu Ala Thr Ile Lys Ser Gly Val Ala Ala Ala Val 45 40 Ser Ser Asn Pro Arg Met Gly Ala Ser Leu Leu Arg Leu His Phe His 55 60 Asp Cys Phe Val Asn Gly Cys Asp Ala Ser Val Leu Leu Ser Gly Asn 75 70 Glu Gln Asn Ala Pro Ala Asn Ala Gly Ser Leu Phe Gly Phe Gly Val 85 90 Ile Asp Asn Ile Lys Thr Gln Leu Glu Gly Ile Cys Lys Gln Thr Val 105 110 100 Ser Cys Ala Asp Ile Leu Thr Val Ala Ala Arg Asp Ser Val Val Ala 125 115 120 Leu Gly Gly Pro Ser Trp Thr Val Pro Leu Gly Arg Arg Asp Ser Thr 130 135 140 Ser Ala Thr Gly Asn Thr Gly Asp Leu Pro Gly Pro Gly Ser Ser Leu 145 150 155 160 Ala Gln Leu Gln Ala Ala Phe Ala Lys Lys Asn Leu Asn Thr Val Asp 170

```
Met Val Ala Leu Ser Gly Ala His Thr Ile Gly Arg Ala Gln Cys Gln
                         185
Asn Phe Arg Ser Arg Ile Tyr Gly Gly Asp Ser Asn Ile Asn Ala Ala
                    200
                             205
 195
Phe Ala Thr Ser Leu Lys Ala Asn Cys Pro Gln Ser Gly Gly Asn Gly
                                  220
 210 215
Asn Leu Ala Ala Leu Asp Ala Thr Thr Ala Asn Ala Phe Asp Asn Ala
    230 235 240
Tyr Tyr Thr Asn Leu Leu Ser Gln Lys Gly Leu Leu His Ser Asp Gln
    245 250 255
Val Leu Phe Asn Asn Gly Ser Thr Asp Asn Thr Val Arg Asn Phe Ala
                      265 270
Ser Ser Gly Ala Ala Phe Ser Ser Ala Phe Ala Thr Ala Met Ile Lys
275 280 285
Met Gly Asn Ile Ser Pro Leu Thr Gly Thr Gln Gly Gln Ile Arg Leu
 290 295
Ser Cys Ser Lys Val Asn Ser
               310
<210> 117
<211> 230
<212> PRT
<213> Lolium perenne
Met Ala Val Ser Glu Leu Glu Val Asp Gly Val Val Phe Pro Pro Leu
             5
Ala Arg Pro Pro Gly Thr Ala His Ala His Phe Leu Ala Gly Ala Gly
                       25
       20
Val Arg Gly Met Glu Leu Gly Gly Asn Phe Ile Lys Phe Thr Ala Ile
                             4.5
                     40
Gly Val Tyr Leu Gln Ala Asp Ala Ala Val Ser Ala Leu Ala Thr Lys
                  55
                                 60
Trp Ala Gly Lys Pro Ala Asp Glu Leu Ala Ala Asp Asn Ala Phe Phe
                              75
             70
Arg Asp Val Val Thr Gly Glu Phe Glu Lys Phe Thr Pro Val Thr Met
           85
                           90
Ile Leu Pro Leu Thr Gly Ala Gln Tyr Ser Glu Lys Val Thr Glu Asn
                  105 110
         100
Cys Val Ala Tyr Trp Lys Ala Val Gly Lys Tyr Thr Asn Ala Glu Ala
 . 115 120 125
Ala Ala Val Asp Lys Phe Lys Glu Ala Phe Arg Thr Glu Ser Phe Pro
 130 135
                                   140
Pro Gly Ala Ser Ile Leu Phe Thr His Ser Pro Ala Gly Val Leu Thr
145 150
                             155
Val Ala Phe Ser Lys Asp Ser Ser Val Pro Glu Ser Gly Gly Val Ala
            165 170
Ile Glu Asn Arg Pro Leu Cys Glu Ala Val Leu Glu Ser Ile Ile Gly
                         185 190
         180
Glu His Gly Val Ser Pro Ala Ala Lys Leu Ser Leu Ala Thr Arg Val
 195 200 205
Ala Glu Leu Leu Asn Glu Ala Ala Pro Val Gly Gln Ala Ala Ala Glu
 210 215
                                   220
Pro Val Ser Val Ser Ala
225
<210> 118
<211> 231
<212> PRT
<213> Festuca arundinacea
Met Ala Val Ser Glu Leu Glu Val Asp Gly Val Val Phe Pro Pro Leu
          5
                            10
Ala Arg Pro Pro Gly Thr Ala His Ala His Phe Leu Ala Gly Ala Gly
```

Val Arg Gly Met Glu Leu Gly Gly Asn Phe Ile Lys Phe Thr Ala Ile 40 Gly Val Tyr Leu Gln Ala Asp Ala Ala Val Ser Ala Leu Ala Ala Lys Trp Ala Gly Lys Pro Ala Asp Glu Leu Ala Ala Asp Asn Ala Phe Phe 70 75 Arg Asp Val Val Thr Gly Glu Phe Glu Lys Phe Arg Arg Val Thr Met 90 95 85 Ile Leu Pro Leu Thr Gly Ala Gln Tyr Ser Glu Lys Val Thr Glu Asn 100 105 110 Cys Val Ala Tyr Trp Lys Ala Val Gly Lys Tyr Thr Asp Ala Glu Ala 120 125 115 Ala Ala Val Asp Lys Phe Lys Glu Ala Phe Lys Ala Glu Ser Phe Pro 130 135 140 Pro Gly Ala Ser Ile Leu Phe Thr His Ser Pro Ala Gly Val Leu Thr 155 150 Val Ala Phe Ser Lys Asp Ser Ser Leu Pro Glu Ser Gly Gly Val Ala 170 175 165 Ile Glu Asn Arg Pro Leu Cys Glu Ala Val Leu Lys Ser Ile Ile Gly 180 185 190 Lys His Gly Val Ser Pro Ala Ala Lys Leu Ser Leu Ala Thr Arg Val 195 200 205 Ala Glu Leu Leu Lys Glu Ala Ala Pro Val Gly Glu Pro Ala Val Ala 210 215 Glu Pro Val Ser Val Ser Ala 230 <210> 119 <211> 394 <212> PRT <213> Lolium perenne <400> 119 Met Ala Ala Thr Met Thr Val Glu Glu Val Arg Lys Ala Gln Arg Ala 1 5 10 Glu Gly Pro Ala Thr Val Leu Ala Ile Gly Thr Ala Thr Pro Ala Asn 20 25 Cys Val Tyr Gln Ala Asp Tyr Pro Asp Tyr Tyr Phe Lys Ile Thr Lys 35 40 Ser Asp His Leu Ala Asp Leu Lys Glu Lys Phe Lys Arg Met Cys Asp 50 55 60 Lys Ser Gln Ile Arg Lys Arg Tyr Met His Leu Thr Glu Glu Ile Leu 65 70 Glu Glu Asn Pro Asn Met Cys Ala Tyr Met Ala Pro Ser Leu Asp Ala 90 85 Arg Gln Asp Ile Val Val Val Glu Val Pro Lys Leu Gly Lys Ala Ala 105 110 100 Ala Gln Lys Ala Ile Lys Glu Trp Gly Gln Pro Arg Ser Lys Ile Thr 115 120 125 His Leu Val Phe Cys Thr Thr Ser Gly Val Asp Met Pro Gly Ala Asp 130 135 Tyr Gln Leu Thr Lys Met Leu Gly Leu Arg Pro Ser Val Lys Arg Leu 145 150 155 Met Met Tyr Gln Gln Gly Cys Phe Ala Gly Gly Thr Val Leu Arg Leu 165 170 Ala Lys Asp Leu Ala Glu Asn Asn Arg Gly Ala Arg Val Leu Val Val 185 190 Cys Ser Glu Ile Thr Ala Val Thr Phe Arg Gly Pro His Glu Ser His 200 205 Leu Asp Ser Leu Val Gly Gln Ala Leu Phe Gly Asp Gly Ala Ala Ala 215 Val Ile Ile Gly Ala Asp Pro Asp Val Ser Val Glu Arg Pro Leu Phe 230 235 Gln Leu Val Ser Ala Ser Gln Thr Ile Leu Pro Asp Ser Glu Gly Ala 245 250

Ile Asp Gly His Leu Arg Glu Val Gly Leu Thr Phe His Leu Leu Lys 265 Asp Val Pro Gly Leu Ile Ser Lys Asn Ile Glu Arg Ala Leu Glu Glu 285 280 Ala Phe Lys Pro Leu Gly Ile Asp Asp Trp Asn Ser Val Phe Trp Val 295 Ala His Pro Gly Gly Pro Ala Ile Leu Asp Met Val Glu Ala Lys Val 310 315 320 Asn Leu Asn Lys Glu Arg Met Arg Ala Thr Arg His Val Leu Ser Glu 325 330 335 Tyr Gly Asn Met Ser Ser Ala Cys Val Leu Phe Ile Met Asp Glu Met 345 350 Arg Lys Arg Ser Ala Glu Asp Gly His Thr Thr Thr Gly Glu Gly Met 355 360 365 Asp Trp Gly Val Leu Phe Gly Phe Gly Pro Gly Leu Thr Val Glu Thr 370 375 Val Val Leu His Ser Met Pro Ile Ala Ala 390 <210> 120 <211> 196 <212> PRT <213> Festuca arundinacea Met Tyr Phe Val Ser Lys Ser Leu Ala Glu Asn Ala Ala Met Asp Tyr Ala Lys Glu Asn Gly Val Asp Phe Ile Ser Ile Ile Pro Thr Leu Val 25 2.0 Val Gly Pro Phe Leu Ser Ala Gly Met Pro Pro Ser Leu Val Thr Ala 4.5 40 Leu Ala Leu Ile Thr Gly Asn Glu Ala His Tyr Ser Ile Leu Lys Gln 55 60 Val Gln Leu Val His Leu Asp Asp Leu Cys Asp Ser Met Thr Tyr Leu 75 70 Phe Glu His Pro Asp Ala Asn Gly Arg Tyr Ile Cys Ser Ser His Asp 85 90 Thr Thr Ile His Gly Ile Ala Arg Met Leu Lys Glu Arg Phe Pro Glu 105 110 100 Tyr Asp Ile Pro Gln Lys Phe Pro Gly Ala Asp Asp Asp Leu Gln Pro 115 120 125 Ile His Phe Phe Phe Lys Lys Leu Leu Asp His Gly Phe Arg Phe Arg 135 140 Tyr Thr Ala Glu Asp Met Phe Asp Ala Ala Val Trp Thr Cys Arg Glu 145 150 155 Lys Gly Leu Ile Pro Leu Gly Ala Glu Gly Ala Gly Gly Pro Ala Ser 165 170 Ala Ala Gly Lys Leu Gly Ala Val Leu Val Gly Glu Gly Gln Ala Ile 180 185 Gly Ala Glu Thr 195 <210> 121 <211> 329 <212> PRT <213> Lolium perenne <400> 121 Met Ala Thr Glu Ala Lys Gly Glu Thr Val Leu Val Thr Gly Ala Ser 5 10 Gly Phe Ile Gly Ser Trp Leu Val Arg Leu Leu Leu Ala Arg Gly Tyr 20 25 Ser Val His Ala Ala Val Leu Asn Pro Asp Asp Lys Ala Glu Thr Asp 40 4.5 His Leu Leu Ala Leu Ala Ala Ala Gly Asp Glu Gly Arg Ile Arg 60 50

Phe Phe Arg Cys Asp Leu Leu Asp Gly Ala Ala Met Leu Ala Ala Val 70 Arg Gly Cys Ser Gly Val Phe His Leu Ala Ser Pro Cys Thr Val Asn 85 90 Leu Val Leu Asn Pro Gln Lys Glu Leu Val Val Pro Ala Val Glu Gly 100 105 110 . Thr Leu Asn Val Leu Arg Ala Ala Lys Glu Ala Gly Gly Val Arg Arg 125 120 Val Val Val Thr Ser Ser Val Ser Ala Leu Val Pro Cys Pro Gly Trp 130 135 140 Pro Ala Gly Glu Val Leu Asp Glu Arg Cys Trp Thr Asp Ile Asp Tyr 145 150 155 Cys Asp Lys Asn Gly Val Trp Tyr Pro Ala Ser Lys Ala Leu Ala Glu 165 170 175 Lys Ala Ala Trp Lys Phe Ala Glu Glu Asn Gly Leu Asp Val Val Thr 180 185 190 Val Asn Pro Gly Thr Val Leu Gly Glu Met Ile Pro Pro Arg Leu Asn 200 205 Ala Ser Met Ala Met Phe Leu Arg Leu Leu Glu Gly Cys Lys Glu Glu 210 215 220 Tyr Ala Asp Phe Phe Ile Gly Pro Val His Val Glu Asp Val Ala Leu 225 230 235 Ala His Ile Leu Leu Tyr Glu Asn Pro Ser Ala Ser Gly Arg His Leu 245 250 255 Cys Val Glu Pro Ile Cys His Trp Ser Val Phe Ala Ala Lys Val Ala 265 270 Glu Leu Tyr Pro Asp Tyr Lys Val Pro Lys Phe Pro Glu Asp Thr Gln 280 285 275 Pro Gly Leu Val Arg Ala Lys Ala Val Pro Lys Lys Leu Met Ala Leu 290 295 300 Gly Leu Gln Phe Thr Pro Leu Glu Lys Ile Ile Arg Asp Ala Val Glu 305 310 315 Ser Leu Lys Ser Arg Gly Cys Ile Ala 325 <210> 122 <211> 328 <212> PRT <213> Lolium perenne <400> 122 Gly Ser Thr Lys Gly Lys Val Cys Val Thr Gly Ala Ser Gly Phe Val 1 5 10 Ala Ser Trp Leu Ile Lys Lys Leu Leu Glu Ser Gly Tyr His Val Ile 25 20 Gly Thr Val Arg Asp Pro Gly Asn Arg Arg Lys Val Gly His Leu Trp 45 40 Lys Leu Pro Gly Ala Asn Glu Arg Leu Gln Leu Val Arg Ala Asp Leu 55 60 Leu Glu Glu Gly Ser Phe Asp Asp Ala Val Arg Ala Cys Glu Gly Val 70 75 Phe His Ile Ala Ser Pro Val Leu Gly Lys Ser Asp Ser Asn Cys Lys 85 90 Glu Ala Thr Leu Gly Pro Ala Ile Asn Gly Thr Leu Asn Val Leu Arg 105 110 100 Ser Cys Lys Lys Ser Pro Phe Leu Lys Arg Val Val Leu Thr Ser Ser 125 120 Ser Ser Ala Val Arg Ile Arg Asp Glu Thr Gln Gln Pro Glu Leu Leu 140 135 Trp Asp Glu Thr Trp Ser Ser Val Pro Leu Cys Glu Lys Leu Gln 145 150 . 155 Leu Trp Tyr Ala Leu Ala Lys Val Phe Ala Glu Lys Ala Ala Leu Asp 165 170 Phe Ala Lys Glu Asn Asn Ile Asp Leu Val Thr Val Leu Pro Ser Phe

185

```
Val Ile Gly Pro Ser Leu Ser His Glu Leu Cys Thr Thr Ala Ser Asp
                      200
                                      205
Ile Leu Gly Leu Leu Gln Gly Asp Thr Asp Arg Phe Thr Leu Tyr Gly
                215
                                 220
 210
Arg Met Gly Tyr Val His Ile Asp Asp Val Ala Arg Ser His Ile Leu
            230 235
Val Tyr Glu Thr Pro Glu Ala Thr Gly Arg Tyr Leu Cys Ser Ser Val
            245
                           250
Val Leu Asp Asn Asn Glu Leu Val Gly Leu Leu Ala Lys Gln Phe Pro
 260 265 270
Val Phe Pro Ile Pro Arg Arg Leu Lys Asn Pro Tyr Gly Lys Gln Ala
275 280
                                    285
Tyr Gln Leu Asp Thr Ser Lys Leu Gln Gly Leu Gly Leu Lys Phe Lys
  290 295 300
Gly Val Gln Glu Met Phe Asn Asp Cys Val Glu Ser Leu Lys Asp Gln
                          315
305 310
Gly His Leu Leu Glu Cys Pro Leu
<210> 123
<211> 369
<212> PRT
<213> Lolium perenne
<400> 123
Met Ala Pro Val Val Glu Arg Ala Pro Phe Leu Pro Thr Gly Glu Ala
             5
                           10
Thr Leu Arg Pro Ser Phe Val Arg Asp Glu Asp Glu Arg Pro Lys Val
                         25
         20
Ala His Asp Arg Phe Ser Asp Glu Val Pro Val Ile Ser Leu His Gly
                             45
                     40
Ile Asp Asp Ala Arg Arg Thr Glu Ile Arg Asp Arg Val Ala Ala Ala
        55
                                60
Cys Glu Gly Trp Gly Ile Phe Gln Val Val Asp His Gly Val Asp Ala
                             75
               70
Ala Leu Ile Ala Glu Met Ala Arg Leu Ser Arg Asp Phe Phe Ala Leu
                           90
           85
Pro Ala Glu Asp Lys Leu Arg Tyr Asp Met Ser Gly Gly Lys Lys Gly
         100
                         105
                                         110
Gly Phe Ile Val Ser Ser His Leu Gln Gly Glu Thr Val Gln Asp Trp
 115 120 125
Arg Glu Ile Val Thr Tyr Phe Ser Tyr Pro Val Lys Ala Arg Asp Tyr
130 140
 130 135
Gly Arg Trp Pro Asp Lys Pro Ala Gly Trp Arg Ala Val Val Glu Gln
               150
                             155
Tyr Ser Glu Arg Leu Met Ala Leu Ser Cys Lys Leu Leu Gly Val Leu
                            170
                                            175
            165
Ser Glu Ala Met Gly Leu Glu Thr Glu Ala Leu Ser Lys Ala Cys Val
         180
                         185
                                         190
Asp Met Asp Gln Lys Val Val Val Asn Phe Tyr Pro Lys Cys Pro Gln
                    200
                                   205
 195
Pro Asp Leu Thr Leu Gly Leu Lys Arg His Thr Asp Pro Gly Thr Ile
                                220
 210 215
Thr Leu Leu Gln Asp Leu Val Gly Gly Leu Gln Ala Thr Arg Asp
                               235
225 230
Gly Gly Asn Thr Trp Ile Thr Val Gln Pro Ile Ala Gly Ala Phe Val
                                            255
            245
                            250
Val Asn Leu Gly Asp His Gly His Tyr Leu Ser Asn Gly Arg Phe Lys
                                         270
                         265
       260
Asn Ala Asp His Gln Ala Val Val Asn Gly Glu Ser Ser Arg Leu Ser
  275 280
Ile Ala Thr Phe Gln Asn Pro Ala Pro Asp Ala Lys Val Trp Pro Leu
 290 295 300
```

Ala Val Arg Glu Gly Glu Asp Thr Ile Leu Glu Glu Pro Ile Thr Phe

315

Thr Glu Met Tyr Arg Arg Lys Met Ala Arg Asp Leu Glu Leu Ala Lys 325 330 Arg Lys Lys Gln Ala Lys Ala Asp Gln Leu Lys Gln Gln Leu Gln Gln 345 Glu Ala Ala Pro Ala Ala Ala Pro Thr Lys Pro Leu Asn Gln Ile Leu 355 360

<210> 124 <211> 380 <212> PRT <213> Festuca arundinacea

<400> 124 Met Ala Ser Val Glu Asn Ala Pro Phe Leu Pro Thr Ala Ala Thr Gly Glu Ala Thr Leu Arg Pro Ser Phe Val Arg Asp Glu Asp Glu Arg Pro 20 25 Lys Val Ala His Asp Arg Phe Ser Asp Glu Val Pro Val Ile Ser Leu 4.5 40 His Gly Ile Asp Asp Gly Gly Ala Arg Arg Ala Glu Ile Arg Asp Arg 55 Val Ala Ala Ala Cys Glu Gly Trp Gly Val Phe Gln Val Val Asp His 75 Gly Val Asp Ala Ala Leu Val Ala Glu Met Ala Arg Leu Ser Arg Glu 90 85 Phe Phe Ala Leu Pro Ala Glu Asp Lys Leu Arg Tyr Asp Met Ser Gly 100 105 110 Gly Lys Lys Gly Gly Phe Ile Val Ser Ser His Leu Gln Gly Glu Thr 125 120 Val Gln Asp Trp Arg Glu Ile Val Thr Tyr Phe Ser Tyr Pro Val Lys 140 135 Ala Arg Asp Tyr Gly Arg Trp Pro Glu Lys Pro Ala Gly Trp Arg Ala 145 150 155 Val Val Glu Gln Tyr Ser Glu Arg Leu Met Ala Leu Ser Cys Lys Leu 170 175 165 Leu Gly Val Leu Ser Glu Ala Met Gly Leu Glu Thr Glu Ala Leu Ser 185 190 180 Lys Ala Cys Val Asp Met Asp Gln Lys Val Val Val Asn Phe Tyr Pro 195 200 205 Lys Cys Pro Gln Pro Asp Leu Thr Leu Gly Leu Lys Arg His Thr Asp . 210 215 220 Pro Gly Thr Ile Thr Leu Leu Leu Gln Asp Leu Val Gly Gly Leu Gln 225 230 Ala Thr Arg Asp Gly Gly Asn Thr Trp Ile Thr Val Gln Pro Val Pro 245 250 Gly Ala Phe Val Val Asn Leu Gly Asp His Gly His Tyr Leu Ser Asn 270 260 265 Gly Arg Phe Lys Asn Ala Asp His Gln Ala Val Val Asn Gly Glu Ser 280 285 Ser Arg Leu Ser Ile Ala Thr Phe Gln Asn Pro Ala Pro Glu Ala Lys 300 295 Val Trp Pro Leu Ala Val Arg Glu Gly Glu Asp Thr Ile Leu Glu Glu 315 305 310 Pro Ile Thr Phe Thr Glu Met Tyr Arg Arg Lys Met Ala Cys Asp Leu 330 325 Glu Leu Ala Lys Arg Lys Lys Gln Ala Lys Ala Asp Gln Leu Lys Gln 345 350 Gln Leu Gln Gln Gln Gln Glu Ala Val Ala Ala Ala Pro Lys 360 Pro Ala Thr Thr Lys Pro Leu Asn Gln Ile Leu Ala 375

WO 03/040306 PCT/NZ02/00239

```
<210> 125
<211> 2105
<212> DNA
<213> Lolium perenne
<400> 125
                                                                      60
acttagcctt cctcqqaacc atcgaccggg ccgccgccga cgcgacgcga cgcgatggag
tccagegccg tcgtccccgg caccacggcg ccgctgcttc cttatgcgta cgcgccgctg
                                                                     120
                                                                     180
ccgtcgtcct ccgacgacgc ccgtgaaaac agaagtagcg gcggcgtgag gtggcgcgcg
                                                                     240
tgcgccgccg ttctggcggc ctcggcgttg gcggtggtgg tcgtggtcgg gctcctcgcg
ggcggcaggg tggatcgggt cccggccggc gcagacgtgg cgtcggccac ggtgccggcc
                                                                     300
gtgccgatgg agttcccgag gagccggggc aaggacttgg gcgtgtcgga gaagtcctcc
                                                                     360
ggtgcctact ccgccgacgg cgggttcccg tggagcaacg ccatgctgca gtggcagcgc
                                                                     420
accgggttcc atttccagcc ggagcagcac tacatgaacg atcccaacgg ccccgtgtac
                                                                     480
                                                                     540
tacqqcqqat qqtaccacct cttctaccag cacaacccca agggcgacag ctggggcaac
atcgcctggg cccacgccgt gtccaaggac atggtcaact ggcgccacct cccgctcgcc
                                                                     600
atggttcccg accagtggta cgacagcaac ggcgtcctca ccggctccat caccgtgctc
                                                                     660
cccgacggcc aggtcatcct gctctacacc ggcaacaccg acaccctagc ccaggtccag
                                                                     720
tgcctcgcca cgcccgccga cccgtccgac ccgctcctcc gcgaatggat caagcacccc
                                                                     780
                                                                     840
gccaacccca tectetteec geogeeeggg ategggetea aggaetteeg egaeeegete
                                                                     900
accgcctggt tcgaccactc cgaccacacc tggcgcaccg tcatcgggtc caaggacgac
gacggccacg ccggcatcat cctcagctac aagaccaagg acttcgtcaa ctacgagctc
                                                                     960
atgcccggga acatgcaccg cgggcccgac ggcaccggca tgtacgagtg catcgacctc
                                                                    1020
taccccgtcg gcggcaactc gtcggagatg ctcggcggcg acgactcgcc cgacgtgctc
                                                                    1080
                                                                    1140
ttcqtqctca aqqaqaqcag cgatgacgaa cgtcacgact actatgcgct cggaaggttc
gacgccgtcg ccaacgtttg gacgcccatc gaccgggacc tggaccttgg gatcgggctc
                                                                    1200
agatacgact ggggaaagta ctacgcctcc aagtccttct acgaccagaa gaagaaccgc
                                                                    1260
                                                                    1320
cgcatcgtat gggcatacat cggcgagacc gactccgagc aggccgacat caccaaggga
tgggccaatc tcatgacgat tccaagaacg gtggagcttg acaggaagac ccgcacaaac
                                                                    1380
ctcatccaat ggccagtgga ggaggtcgac accctccgca ggaactccac ggacctcggt
                                                                    1440
cgcatcaccg tcaacgccgg ctccgtcatt cgcctccccc tccaccaggg cgctcaactc
                                                                    1500
gacatcgagg cctccttcca actcaactct tccgacgtgg atgctatcaa cgaggccgac
                                                                    1560
qtcqqctaca actqcaqcac caqcqqtqcc gccgtacggg gggcgctcgg cccctttggc
                                                                    1620
ctcctcgtcc ttgccaatgg ccgcaccgaa cagacggctg tgtacttcta cgtgtccaag
ggcgtcgacg gcggcctcca gacccacttt tgccacgacg agtcacggtc aacacgggca
                                                                    1740
                                                                    1800
aaggatgtcg tgaataggat gattggcagc atcgtgccgg tgcttgacgg tgagaccttt
                                                                    1860
tcggtgaggg tgctagtgga ccactccatc gtgcagagct tcgcgatggg cgggaggatc
acggcgacgt cgcgggcgta cccgacggag gccatctacg cggccgcagg ggtctacctc
                                                                    1920
ttcaacaacg ccacgggcgc caccgtcacc gccgagaggc tcgtcgtgca cgagatggcc
                                                                    1980
tcagctgaca accatatctt cacgaacgac gacttgtaga tgaaaccaag tttagctcgt
                                                                    2040
                                                                    2100
qttgcattct tgttaacggc cggtgattgc ctatctacac attcatttgg cgttcaaaaa
                                                                    2105
aaaaa
<210> 126
<211> 2068
<212> DNA
<213> Festuca arundinacea
<400> 126
cccatccacc ggagtatact aggaaattcc tgcaactcga cctcgcgttg ggaattccgg
                                                                      60
                                                                     120
caatggagtc ccgggccttt cccaacgcgg cgtacgcgcc acttctgcca cccaccgctg
acgacgccac cctgggcaag caggaccgcc ccggcgtggg gtggcgcggg ttcttaaccg
                                                                     180
tgctggccgc gtctggcgtg gtggtgctcc tcgtcgctgc cactatgctc gcgggatcca
                                                                     240
                                                                     300
ggatgggtca ggcaggcgac accgacgagg acggggccgg agggttcccg tggagcaacg
agatgctgca gtggcagcgc gccgggttcc attaccagcc cgaggggcac ttcatgagcg
atccaqacqq tccqqtatac taccqtggat attaccacct cttctttcag tacaaccgaa
                                                                     420
                                                                     480
ggggcgtcgc gtgggatgac tacatagagt ggggccacgt ggtgtcccag gacctggtac
actggcgccc teteccactg gccctgcggc ctgaccattg gtacgacaag aagggcgtct
                                                                     540
                                                                     600
tgtcgggtac catcacggtg ctccacaatg gcacgctcgt cctgctctac acgggggtca
cagaagaccc tatggccgag tctcagtgca tcgccgtccc gaccgacccc aacgacccc
                                                                     660
tecttegeca ttggaccaag caccegeca accetgttet egeteaceca cagggggtee
                                                                     720
agggcatgga cttccgagac cccaccagtg catggtttga caagtccgac gccacgtggc
                                                                     780
gcattctcat cggttccaag gatgacgaca atggaagcca cgctggcatc gccttcatct
                                                                     840
tcaagaccaa ggacttcctt agcttcgagc gcgtcccagg tatcgtgcat cgtgtcgagg
                                                                     900
gtaccggtat gtgggagtgc atcgactttt accccgtcgg aggtggccac aactcttcgt
                                                                     960
1020
```

tggggagata tgacge ggattggget gagata tgacgageg gegaat ttgccaaggg atggge ccaggacgaa cetect ccgacetcag tggcat acgaggecga tgtegg teggeceett eggeet tgtactteta egtgte tgetecaegg tgagge tegecatggg tgggag ecagggeagg ggtgta teategtgea egagat egtagetget cacatg gegttgaata atttac gatattette caaaat	acgac tggggcaago tatg ttggggtatg teta cttcagtcga tecta tggccggtgg teact gttgacaacg tcgag gcttccttcc gctat aactgcagca tcctc gtccatgccg tcagg gccctcgacg ggcc agggacgtga tgggc acgggacgtga tgggc tcgacgagc tactg ttcaacaacg tggcc tcggcggtat tgagct atatatcaga tgtta cttagcaago	tctacgctgc taggcgagac ttccgaggac aggaggtgga gctcagtctt gcctcgacgc gcagcggtgg ccggagacct gtaccctccg cgaagcgggt tgctcgtgga cgcgggttga ccacggggtta ccacggggtta ccacggggt	cacgtcgttc cgactctgca agtgacacta ggccctccgc ccacctcccc ttctgacgtt cgcggccgca ccgtggcgag gactagcttc ggtgggcagc ccactccatc cccaacggag cagcgtgact cctgatcatg tgggtcact	tacgatccgc cgagccgacg gacgagaaga tacaactcca ctccaccaag gccgcatca cgtggcgcta cagacggcgg tgcaacgacg acggtgccgg gtgcagagct gccatctacg gcggagagcc gttgaggact gcatttccaa	1080 1140 1200 1260 1320 1380 1440 1500 1660 1620 1680 1740 1800 1860 1920 1980 2040 2068
<210> 127					
<211> 2198					
<212> DNA <213> Lolium pere	anne				
ZION HOTTOM Pere	Simic .				
<400> 127			,	. 1	60
cacccatcca ccggaa	atata tatactageo	aggaaattcc	tgcaactcga	acttctacca	60 120
ggaattccgg caatgg tccgccgcag acgacg	gagte eegggeetti	. cecagegegg	ccaacataaa	ataacacaaa	180
ttcttaaccg tgctgg	accae etacaacato	ataatactcc	tcatcaatac	cactttqctc	240
gcgggatcca ggatgg	ggtca ggcaggcga	ggcgaaggca	acaccgacga	ggatggggcc	300
ggagggttcc cgtgga	agcaa cgagatgctg	, cagtggcagc	gcgccgggtt	ccattaccag	360
ccggagggc acttca	atgag cgatccaaad	ggtccagtat	actaccgcgg	atattaccac	420
ctcttctttc agtaca	aaccg aaggggcgto	gcgtgggatg	actacataga	gtggggccac	480
gtggtgtccc aggaco	ctggt acactggcg	cctctcccac	tggccatgcg	gcctgaccat	540 600
tggtacgaca agaagg	ggcgt cttgtcggg	accatcacgg	agtoccacaa	categoric	660
ccgaccgacc ccaacg	ggggt Cacagaaya gaccc cctccttcg	cattaggeeg	agcacccag	caaccccqtc	720
ctcgctcacc cacago	gacet ectected; agggt ccagggcat	gacttccgag	accccaccag	cgcgtggtgg	780
gacaagtccg atgcca	acgtg gcgcattct	atcggttcca	aggacgacga	caacggcagc	840
cacqctqqca tcgcct	ttcat cttcaagact	: aaggacttcc	ttagcttcga	gcgtgtccca	900
ggtatcgtgc atcgtg	gtcga gggcaccgg	c atgtgggagt	gcatcgactt	ttaccccgtc	960
ggaggtggcc acaac	tcttc gtcggaggag	g ttgtacgtga	taaaggcgag	catggacgac	1020 1080
gaacgccacg actact	tactc attggggag	g tacgacgcgg	cagcgaacac	arggacgcca	1140
ttggacgccg agctagtccacgtcgt tctacg	gactt ggggattgg	g cugagatacy	tattagagta	tataaacaaa	1200
gtcgactctg cgcga	gacca tgttgccaa	g eggegedeed g agataaacct	cacttcaatc	gattccgagg	1260
acagtggcgc tagac	gagaa gacccgaac	aacctcctcc	tatggccggt	ggaggaggtg	1320
gaggeeetee getaca	aactc caccgacct	c agcggcatca	ccattgacaa	cggctccgtc	1380
ttccacctcc cactc	cacca gaccactca	g ctggacatcg	aggcttcctt	ccgcctcgac	1440
gcttctgatg ttgcc	gccat caacgaggc	c gacgtcggct	acaactgcag	cagcagcggc	1500
ggcgcggcgg cacgt	ggcgc tctcggccc	tteggeetee	tegtecatge	cgccggagac	1560 1620
ctccgtggcg agcag cggaccagct tctgc	acgge ggtetaett	tacgtgtcca	gggcccccga	dacdaadcaa	1680
gtggtgggca gcacg	atacc agtactcas	, racasaacat	tatcaataaa	agtgctcgtg	1740
gaccactcca tcgtg	cagag cttcgcgat	a ddcdddadda	ccacggcgac	ctcgcgcgtg	1800
tacccgacgg aggcc	atcta cgccagggc	t ggggtgtacc	tgttcaacaa	cgccaccggc	1860
gccggcgtga cggcg	gagag gctcatcgt	g cacgagatgg	cctcggcggt	atacgacgag	1920
acceteatgg ttgag	gactc atagctgct	c acccgtaacg	ttgggtcact	tgcatttcca	1980
agcgttgaat taata	attta cttgttgta	g cagcaagcaa	cggtccgagg	ttccaagtaa	2040
ggtgggatat tctac	caaac tccgcgagt	c ccgcaaggtt	grgraggrgr tattettt	yayııyaıyı aaaaaqaaaq	2100 2160
tggcgcacct gcgcg ataccaatct accat			·	. addadagadag	2198
	gaaagaata				

```
<210> 128
<211> 2208
<212> DNA
<213> Lolium perenne
<400> 128
                                                                       60
cacccatcca ccggagtata ctagctagga aattcctgtg caactcgacc tcgagtttgg
aattccggca atggagtccc gggactttcc cagcgcggcg tacgcgccac ttctgccatc
                                                                      120
                                                                      180
tgccgcagac gacgtcgccc tggccaagca ggaccgcccc ggcgtggggt ggcgcggctt
cttaaccgtg ctggccgcct gcggcgtggt ggtgctcctc gtcgctgcct ctttgctcgc
                                                                      240
                                                                      300
qqqqtccagq atqqqtcagq caggcgacac cgacgaggac ggggccggag ggttcccgtg
gagcaacgag atgctgcagt ggcagcgcgc cgggttccat taccagccgg aggggcactt
                                                                      360
catgagcgat ccagacggtc cggtatacta ccgtggatat taccacctct tctttcagta
                                                                      420
caaccgaaga ggggtcgcgt gggatgacta catagagtgg ggccacgtgg tgtcccagga
                                                                      480
                                                                      540
cctqqtacac tqqcqcctc tcccactgqc catqcgqcct gaccattgqt acgacaagaa
gggcgtcttg tcgggtacca tcacggtgct ccacaatggc acgctcgtcc tcctctacac
                                                                      600
                                                                      660
gggggtcaca gaagacccta tggccgagtc ccagtgcatc gccgtcccga ccgaccccaa
                                                                      720
cgacccctc cttcgccatt ggaccaagca ccccgccaac cccgttctcg ctcacccaca
gggggtccag ggcatggact tccgagaccc caccagcgcg tggtgggaca agtccgactc
                                                                      780
                                                                      840
cacgtggcgc attctcatcg gttccaagga cgacgacaac ggcagccacg ctggcatcgc
cttcatcttc aagaccaagg acttccttag cttcgagcgt gtcccaggta tcgtgcatcg
                                                                      900
tgtcgagggt accggcatgt gggagtgcat cgacttttac cccgttggag gtggccacaa
                                                                      960
ctcttcgtcg gaggagttgt acgtgataaa ggcgagcatg gacgacgaac gacacgacta
                                                                     1020
ctactcattg gggaggtatg acgcggcagc gaacacatgg acgccattgg acgccgagct
                                                                     1080
                                                                     1140
agacttgggg attgggctga ggtacgactg gggcaagctc tacgcttcca cgtcgttcta
                                                                      1200
cgatccactg aagcagcggc gaattatgtt ggggtatgta ggcgaggtcg actctgcgcg
agccgacgtt gccaagggat gggcctcact tcagtcgatt ccgaggacag tggcactaga
                                                                     1260
                                                                     1320
cgagaagacc cggacgaacc tcctcctatg gccggtggag gaggtggagg ccctccgcta
caactccacc gacctcageg gcatcactgt tgagaacggc tccatcttcc acctcctct
                                                                     1380
ccaccaagcc actcagctgg acatcgaggc ttccttccgc ctcgatgctt ctgatgttgc
                                                                      1440
tgccatcaac gaggccgacg tcggctacaa ctgcagcagc agcggtggcg cggccgctcg
                                                                      1500
tggcgctctc gggcccttcg gcctcctcgt ccatgccgcc ggagacctcc gtggcgagca
                                                                      1560
gacggcggtg tacttctacg tgtccagggc cctcgacggt agcctccgga ccagcttctg
                                                                      1620
caacgacgag acgcggtcgt cacgggcccg ggacgtgacg aagcgggtgg tgggcagcac
                                                                      1680
ggtgccggtg ctcgacggcg aggtgttagc gatgagggtg ctcgtggacc actcgatcgt
                                                                      1740
                                                                      1800
gcagagcttc gcgatgggtg ggagggtcac ggcgacgtcg cgggtgtacc caacggaggc
tatctacgcc agggcagggg tgtacctgtt caacaacgcc accggcgcca gcgtgacggc
                                                                      1860
                                                                      1920
ggagaggctc atcgtgcacg agatggcctc ggcggtatac gacgagaccg tcatggttaa
                                                                      1980
ggactcatag ctgctcacac atgagctatc agaccggtaa cgttgggtca ctagcatttt
caagegttga aataatttac ttggcgtagc aagccccggg tccgaggttc caaaagtaag
                                                                      2040
                                                                      2100
gtgggatatt cttccaaact ccgcgagtcc cgcaaggttg tctaggtgtg agtgtgatgt
cgtttgcgca cctgcgcgtg tgcttgtaat ttgctggatt tgttgtttct ttacagaaaa
                                                                      2160
                                                                      2208
aaaaggatac tatactatgt aagtatctac attgttgtaa aaaaaaaa
<210> 129
<211> 1790
<212> DNA
<213> Festuca arundinacea
<400> 129
                                                                        60
caccaacgaa attcgggagg aagaaaggcg ctcgcccatc tctcccgaaa caaccgctcg
ccaccegtct ccctccctg ccctcgcctc cccattcccc ttcctcttct tcccttggcg
                                                                       120
acggectegt egateggace caatetecae caaacgegee teeggatete gegegeegee
                                                                       180
                                                                       240
tcgaagggga tcctcccgtg gccgccgtcc tcctccgccg ctcggctgga ctgtcgtgga
geggggateg accegggete tetgtegetg gttgetaaaa tggataaget caatggttet
                                                                       300
gcgcgtctta tgattgtttc agacctcgat catacaatgg ttgatcatca tgacgaagag
                                                                       360
aacttgtcgt tgcttaggtt tgggggccctt tgggagtctg cttactgtca ggattctcta
                                                                       420
cttgtcttct cgaccggaag atcacccact ctctataagg aattgaggaa agagaagcct
                                                                       480
atgctaactc cagacatcac tattatgtcg gtgggcagtg agataactta tggtgaggcc
                                                                       540
atggttcctg atgatggctg ggaggaatat ctgaacaata agtgggacag aaatattgtt
                                                                       600
cttgaggaga ccgctaagta ttctgagctg aagcttcagc cagagacaga acagcgtcca
                                                                       660
cataaggtca gcttcttggt tgacaagaag agtgctcagg aagtgataaa gtctctctct
                                                                       720
gagaagtttg agaaacgtgg ggtagatgca aaaataatct atagtggtgg ccaagacctt
                                                                       780
gacatattag ctcaaggggc tggaaagggt caggcgcttg catatttact caagaagttc
                                                                       840
gcctcatgcg ggaaaacacc caacaatact cttgtttgtg gtgactctgg caatgatgca
                                                                       900
gaattattca gcatccctgg tgtgcacggt gtcatggtta gcaatgccca agaggaacta
                                                                       960
```

tgtgctgctg agagacattg aagttctatg atagagtact gaactttcga aaaaagtacc cttgtgagat cttgcgctga	gtattattca agtttcctta ttctctgcga tcaaaaacat tccattcttc gatcatgggt ttgacttgtg atgtaaagcc	tgcgaaggat agctattggg cgtcaaggag gaagtggcgt cacggatgca catcgatgcg ggacagacta ggaggcagaa tgaaacccct	cacttcaagc gactctttca agggctgacg agtggagtta ttggcttcat gttatctcac ggtgatgcat gggggtttcg	taggacctaa agcctacagc ttccaaaggc ttattcatcc gttatggtga agactgcttc gggtgtgctg tggtaacaca	tatttctcca ggctgttgtg tgattcagtt ctctggcctc caaacaaggg tgacagttgg tttgacaact catccacaag	1020 1080 1140 1200 1260 1320 1380 1440
ccgtcagcgc gagaatttct actggatgaa	acgggaagga tttccttgtt gtatacggag	cggggatgag aattttcttg cataatgtta gtcttgatgc	agaatcaaat ataagtgctc ttggcctaat	aagaagcgca ccagacacta gcttacttga	cagaaaacac catatatcat	1560 1620 1680 1740 1790
<210> 130 <211> 3633 <212> DNA	ica arundina	ctggcatgag	aayetyaayt	aaaaaaaaa		1,00
<400> 130			1		+	60
gcagagtagc	ctgcctgctc	gccggcgaga cgtcgagatg	gatagetagg	gagggagggt	caacaaatac	120
ctagaaacaa	tectagaege	cgggtcgaag	ctacaaccac	aggacataca	actaccacca	180
ctggaggega	caccaacact	cgcggccgag	gagtccggcg	ccgcctacaa	ccccaccagg	240
tacttcgtgg	aggaggtggt	caggagcttc	gacgagcagg	ccctccacaa	gacatggaca	300
aaggtggttg	cgatgcggaa	cagccaggag	cgcagcaacc	ggctggagaa	cctgtgctgg	360
aggatctgga	acgtctccag	gcagaagaag	caggtggagt	gggattacac	gaaagaggtg	420
gcccggcgga	agcttgagca	ggagctgggc	agccgggagg	ccgccgagga	cctctccgag	480
ctctccgagg	gcgagaagga	taccaccacc	gccaagcctg	acgccgcaac	cgctcaaccg	540 600
tccaccgacg	atggcgagca	ccagcagcca	caaccacgca	cccggctcgc	gaggatcaac	660
tccgaggtgc	ggctcgtctc	cgacgacgag	gaggagcaga	ccaagaagag	gaacctctac	720
atcgtcctca	reageateea	tgggctggtg gaagtacgtg	cgcggggaga	acatygaget	adcadccaca	780
acagagatas	aggecagge	cctgctgacg	carcagatet	cctacccca	catagactag	840
acctacaca	accoggggga	gatgctggag	cacctatcat	caacaaacac	ggacgaggac	900
ascaacasac	agtctggcgg	cggggcgtac	atcqtqcqqc	taccatacaa	gcccagggac	960
cagtacatcc	ccaaqqaqqa	gctgtggccg	cacatcccgg	agttcgtgga	ccgcgcgctc	1020
tcgcacgtca	ccgaggtggc	gcgcgcgcta	ggcgaccagc	tccagcctcc	tcccactccg	1080
gccgcgggcg	acggcgcagc	cctagtggca	gcgcccatat	ggccgtacgt	gatccacggc	1140
cactacgcgg	acgcggcgga	ggtggcggcg	aacctggcga	gcgcgctgaa	cgtgcccatg	1200
gtcatgacgg	gccactcgct	ggggcgcaac	aagctggagc	agctgctcaa	gctgggccgc	1260
atgccgggcc	ccgagatcca	gggcacctac	aagatcgcgc	gccggatcga	ggccgaggag	1320
accggcctcg	acaccgcgga	gatggtggtc	accagcacca	agcaggagat	cgaggagcag	1380
tggggcctct	acgacggctt	cgacctcatg	gtggagcgca	agctcagggt	aaggcagcgc	1440 1500
cgcggcgtca	gcagcctcgg	caggtacatg	ccgcgcatgg	eggicateee	cctacacata	1560
gacttcagct	ccascasacc	acaggacacg caagaaggct	ctacctccca	tttaatcaaa	catactaaga	1620
ttcttcacca	acccccacaa	accastasta	ctagcactat	cacaaccaa	cccgaagaag	1680
aacgtcacta	cactactcaa	gacctacaac	gagageegee	agctccggga	gctcgcgaac	1740
ctgactttga	tactggggaa	cagggatgac	atcgaggaca	tggccggcgg	cggcggcgcg	1800
gtgctcacgg	cggtgctcaa	gctcatcgac	cgatacgacc	tctacggcca	ggtggcctat	1860
ccaaagcacc	acaagcagac	ggacgtgcct	cacatctacc	gcctcgctgc	aaagaccaag	1920
ggagtattca	ccaacccagc	tcttgtagag	ccgttcggcc	tcacaatcat	cgaggctgct	1980
gcttacggtt	tgccggtggt	cgcaaccaag	aacggagggc	cggtggacat	cctcaaggcg	2040
ctcaacaacg	ggctgctggt	ggacccgcac	teggeggagg	cgatcaccgg	cgccctgctg	2100
agcctgctgg	ccgagaagtc	gcggtgggtg	gagtgccgcc	gcaacggcci	ccgcaacatc	2160 2220
caccgcttct	cgtggccgca	gcatataa	gtgccctct	acctacytete	cacctactgc	2220
ttcccccc	- egeogeacea	ctcccsctccgc	gradected	tataactaca	ctcgaccagc gatatccgtg	2340
racace+cca	acyacicyci	Caccacacac	tecacaacca	ccatcatoga	cgcgctccgc	2400
Gacacacaca	cctccaaaaa	GCCGCGGGGGC	tacaatacaa	agacactcaa	cttcgcgccc	2460
adccaacaaa	agageeteet	aafaafcacc	atcaactact	acggcgacga	cggcaagccg	2520
gacgtcaagg	agctaaagaa	ggccat.cgac	acaacaatat	cggttggtga	atgcgcggga	2580
gctaagcagg	ggtacgtgct	gtcgaccgac	atgaccatcc	ccgaggccgc	ggaggcgatc	2640
aaggcgtgcq	gcgccgacgt	tgccagcttc	gacgcgctga	tatgcagcag	cggggccgag	2700
		3				

ctatgctacc	-~+~~~~~	actoacaaca	ascasaasat	acteedddea	catcacattc	2760
ctatgctacc	cgtggaagga	getegeggee	gacgaggage	tagagagett	adaddadatc	2820
cggtggcccg	gtgaccacgt	gaaateegee	glgdddaggd	cogggageee	ggaggagacc	2880
gccctcgcaa	tcgatcgccc	cgcctgctcc	gtgcactgcc	acgcctacgc	cyccacygac	
gcatccaagg	tgaagaaggt	ggattcgatc	aggaagtcgc	tgcggatgcg	cgggttccgg	2940
tgcaacctcg	tctacacgcg	cgcgtgcacg	cgcctcaacg	tcatccccct	ctccgcttcc	3000
cadccacaca	ctctcaggta	cctgtcgata	cagtggggga	tcgatctctc	caaggtggcg	3060
gtgctcgtcg	acasasccaa	cdacaccdac	cacaaaaaac	tectecegaa	agttcacaag	3120
acgctcatcc	tagagacegg	aatcaccaac	adcadcdadd	anctecteen	aggcgacgac	3180
acgerearee	Lgccgggaat	ggtcgcccgc	ggcagcgagg	agottoctocg	actacacas	3240
gggtacacca	tggcggacgt	cgragecara	gaeteeeea	acattyteac	gctcgctgaa	3300
ggccagtctg	cctccgacct	cctcaaggcc	atctgagagc	gtgctctgct	gereeergra	
ctgcttctgt	tttccacatc	tgggacgcag	tagcttcact	tggattgttt	cgcctgtgat	3360
tttggcagga	agatgatgac	tgcagaattg	catttgcata	taccgtatac	ctgtgcaagc	3420
atgagcaaaa	catotcaoct	aataattctt	taatgttttg	gtcatgcctc	cgtgaggtat	3480
gcttgtgtgc	attctataaa	адааааасдс	aagaatgaaa	gaaagaaata	ttttcaatgt	3540
aagttgatgt	ttcttcctca	caacttctta	cttggattgt	ctacattaat	tatttcaagg	3600
aaatacaagg	ctcttcccga	tagaaaaaaa	222	000000000	-9	3633
aaatacaagg	attitude	LCCaaaaaaa	aaa			0000
<210> 131						
<211> 3747						
<212> DNA						
<213> Loliu	m perenne					
VEROF EGEN	F					
<400> 131						
<4007 T3T			~~~~~~~~	tagastasca	testeteces	60
ctccgatccc	ccacccacct	eccaatttec	ccaagecgca	tcgcatcacc	ataataaaaa	120
agagcaccgc	gatggcgggg	aacgactgga	tcaacagcta	cctggaggcc	accelegacy	
cgggcggcac	cgcgggggac	atctcggccg	cctctgtggc	cggaggcgat	gatgggccgg	180
gcgctggcgg	aggcactgcg	ggggagaagc	gggacaagtc	gtcactcatg	ctccgagagc	240
acaaccaatt	caaccccqcq	cgctacttcg	tcgaggaggt	catctccgga	ttcgacgaga	300
cadacctcta	caagacctgg	atccacacat	caaccataaa	aagcccgcaa	gagaggaata	360
cadacctcca	caagaccagg	tagaagatet	ggaacctcgc	taggaagaag	aagcagattg	420
cycyyclyga	gaacacgccc	++5+45524	aacatattaa	acgtgagaag	actcatcasa	480
aaggtgagga	agecteeegt	Lialcadaga	aacgccccga	acgegagaag	ancettance	540
atgctgctgc	tgatttgtct	gaggacctat	ctgagggaga	aaaaggagaa	aacactaacy	600
gatcatctgt	tcacgatgag	agcacaaggg	gacgaatgcc	aaggataggt	tcaactgatg	
ctattgaggt	gtgggcaaat	cagcacaaag	ataaaaaact	gtacatagtg	ctaataagta	660
ttcatggtct	tatacgtggt	gagaatatgg	agcttgggcg	tgattcagat	acaggcggtc	720
aggtcaaata	tattatagag	cttqctaqqq	cattaggtga	aacacctgga	gtatacagag	780
tagatatat	dacaaddcad	atttctgcac	ctgatgttga	ctggagttac	ggagaaccta	840
angacetget	gacaaggcag	aattotoana	accttadada	tgacatgggt	gaaagcagtg	900
Cagagatget	yaytccaaga babbaaas	aattetgaga	gaagagaaa	gtatatacct	aaadadcadc	960
gtgcttatat	tgttaggata	tettetggae	caayayaaaa	gcatataccc	cagagagaga	1020
tctggcccca	catacaggaa	tttgttgatg	grgcacrigi	Ccatatcatg	cagatgtcca	1020
aggttcttgg	tgaacaagtt	ggtcgtgaac	ggcgagtatg	geetgttgtt	atccacggac	
actatgctga	tgcaggcgat	tctgctgctc	tattatctgg	ggcactcaat	gtcccaatgg	1140
tattcacagg	tcattctctt	ggcagagaca	aattagagca	acttttgaag	caaggacgtc	1200
aaaccaggga	cgaagtaaat	gcaacataca	agataatgcg	tcggattgaa	gctgaggaac	1260
tttatatta	tacatetaaa	attotaatta	caagcactag	gcaagaaata	gagaaacaat	1320
aaaaattata	caatqqattt	gatgtaacta	tagagaggaa	acttagagca	agaacaaagc	1380
ggggactgca	ctactataat	cattacatac	ctcctatcat	tacaattcct	cctggcatgg	1440
gragragrag	tattaggt	catcatatta	acctacatac	taataaaaca	aatgaagttg	1500
agtttageca	Latiguece	catgatgetg	acceggaegg	cgatgaagea	tcaaaccctc	1560
gctcaggttc	accggateca	CCLattiggg	Cigalalaal	gegeeeeee	agtagattag	1620
gtaagcccat	gattctcgct	cttgetegge	cagateccaa	gaayaacacc	actacattgg	
tgaaggcatt	tggtgaacac	cctggattga	gaaatttagc	aaaccttaca	ctgatcatgg	1680
gtaaccgtga	tgttattgat	gaaatgtcaa	gcacaaatgg	agctgttttg	acctcagtac	1740
tcaagttaat	tgacaaatat	gatctatatg	gccaagtggc	ataccccaag	caccataagc	1800
aatctgaagt	tccagatatt	tatcgtttgg	cggcaagaac	aaagggggtt	tttattaatt	1860
atacttatat	tgaaccattt	gggctcacct	tgatcgaggg	tactacttat	ggtctaccga	1920
taattaataa	ccasastact	adacctatea	acatacacco	gattettaac	aatggtatcc	1980
Lygingulac	- anconore	222222222	atacacact	ttataaactt	gtttctgata	2040
rigitgatee	acacaaccaa	aatyatatty	orgayycact	+s+ccs+ccs	ttttattaaa	2100
agcacttgtg	ggcacaatgc	cglcagaatg	gtetggataa	. Latitatiga	ttttcttggc	
ctgaacattg	caagaactat	ttgtcacggg	ttggcacggt	gaagcctaga	catccacgat	2160
ggcaaaggag	tgatgatgct	actgaagttt	ctgaatcaga	ttcacctggc	gattctttga	2220
gggatgttca	tgatatatct	cttaacttga	agctttcctt	ggacagtgaa	. aaagcaggca	2280
ccaagataaa	tactgaacga	aattccacca	. atgccagaag	_{r aaatcttgag}	gatgctgtac	2340
taaaattttc	aaatoctott	agtgagggca	. caaaggatga	gtctgatgag	aatgctgagg	2400
CCaccacaca	ctccaataaa	taaccatctt	tacqqaqqaq	aaaacacatt	gttgttattg	2460
atata anti-	tatacasast	actasettas	++caca++a+	caaaaacctt	tttgaggctt	2520
ciglagatic	-ycycaaaat	gotgactigg	· cttayattat	atcascatct	cgagcaatat	2580
cacgcaaaga	aaaattatt	ggigeigiig	gulligiadi	. geogaeace		2500

cagagacact tacttttta aca tatgcagcag tggcagtgat ctt ctaccgagct tccatttatg att gaggggaagg tttaaggaag aca gacaagaagt tgaagatac tgaggctgtc cct cactgcggtg tcatgtattg taccatgcagtg tcatgtattg taccatgcagt tcatgtattg gat tgcacaagac catcatactc aaa ccagaagcta ttcactggag gat agggatatct cccagaagct ttcactggag gat gtactggtt ggcacaact tgccacaagac ttggagaaattg tgcacaagac tggagaattg tcagtcacaa taaagcaaga ttggacattggat cagttttttg tcagtcacaa taaagcaaga ttgaaaccaatt tgttttggtg tgaaacccattt tgttttggtg tgaattatatttc ttccctcaaa aaa	rigitate cateticaag gatetig attateacte getaggeage gaagaat giteateeae cectgiga aggatetiag aggeeatg atggtageaa aggtact tgtatataeg aggeteat tgtatataeg aggeteat teaeggete geteatat egitegaea agaacage tgtitaeea acagtta agtagagtat gitetiege tgititaeea acageeaa aacteaagge acageea teetigagat agaacatee teetigagat agtagatgt tatatggta	ttcggaagac tcagattgaa agaaaacaac ttactgcatt aaaaacaatg gttgaaggcta tgaagggcta tcaaaccag accaggaatt gttcggtgtg cgtcttcat ccaaaagaat actagtcttgcat ccaaaagaat aataatactg tcgttaatgt	atgettagee tacegttageg agteagagtg teatttaaag agaatteaag atacetete gagetgeaa ettggaggeg etteagteg getteagteg getteagteg etgaactaaa tggtecagat ggeagaataa ttggagetae ttgeagetae ttgeagetae ttgeagat attgtaagae attatettgt	2640 2700 2760 2820 2880 2940 3000 3120 3180 3240 3360 3420 3480 3540 3660 3720 3747
<210> 132 <211> 3743				
<212> DNA <213> Lolium perenne				
-				
<400> 132 cacgegegee egtgegeaea egt	tatatage eegateaata	tcaagttggg	atctttagcg	60
ccggaggagc ggagtagcct gct	togooggo gagggtaatt	agagcaagag	gagtctgctc	120
gccgtcaaca aagatggcgg cgg	gggaacga gtggatcaac	gggtacctag	aggcgatcct	180
ggacgcgggg tcgaagctgc ggg	ccqcaggg cgtgcagctg	ccgccgctgg	agacagcgcc	240
ggcgctcgcg gccgaggaga gca	agcgccgc ctacaacccg	accaggtact	tcgtggagga	300 360
ggtggtcagg agcttcgacg ago	caggeeet ceacaagaca	tggacaaagg	tggttgegat	420
gcggaacagc caggagcgga gca ctccaggcag aagaagcagg tgg	aacegget ggagaacetg	racete	ggcggaaggt	480
tgagcaggag ctgggcagcc ggg	gageggga etacaegaaa gaggaccta	tccgagctct	ccqaqqqcqa	540
gaaggacacc accaccgcca ago	cccgacgc cgcagccgct	caaccgtccg	ccgacgatgg	600
cgagcaccag cagccgcagc cag	cgcacccg gctcgcgagg	atcaactccg	aggtgcggct	660
cgtctccgac gacgaggagg age	cagaccaa gaagaggaac	ctctacatcg	tcctcatcag	720
catccatggg ctggtgcgcg ggg	gagaacat ggagctcggc	cgagactccg	acaccggtgg	780
ccaggtgaag tacgtggtgg ag	ctggcgcg tgcgctggcg	gcgacggcgg	gggtgcaccg	840 900
ggtggacctg ctgacgcggc aga	atctcctg cccggacgtg	gactggacci	acggegagee	960
cgtggagatg ctggagcgcc tg cggcggcggt gcctacatcg tg	caactace atacaaacca	aggacgacg aggaccagt	acatccccaa	1020
ggaggagctg tggccgcaca to	cccaagtt cgtggggccg	gcactctcac	acgtcaccga	1080
ggtcgccgc gcgctcggcg ag	cageteca geetectect	teteeggeeg	acggcgcggt	1140
ggcggcgccc atctggccgt ac	gtgatcca cggccactac	gcggacgcgg	cggaggtggc	1200
ggcgaacctg gcgagcgcgc tg	aacgtgcc catggtcatg	acgggccact	egerggggeg	1260
caacaagctg gagcagctgc to	aagctcgg ccgcatgccg	ggccccgaga	tccagggcac	1320 1380
ctacaagatc gcgcgccgga tc	gaggccga ggagacgggg	r ctcgacaccg	acttcaacct	1440
ggtcaccagc accaagcagg ag catggtggag cgcaagctcc gg	ategagga geagegggg	r dtcadcadcc	tcagacagta	1500
catgorgag cycaayetee gg catgoogog atggoggtca to	ccacccaa catagactto	agcttcgtcg	agacacagga	1560
cacggctgac ggggacggcg cc	gateteca gatgeteatt	gctcccgaca	aggccaagaa	1620
ggctctgcct cccatttggt ca	gacgtgct gcggttcttc	: acgaacccgc	acaagccgat	1680
gatectggeg etgtegegge eg	gacccaaa gaagaatgto	: accacgctgc	tcaaggccta	1740
cggcgagage egecagetee gg	gagetege gaacetgaca	ı ctgatactgg	ggaacaggga	1800
tgacatcgag gacatggccg gt	ggcggcgg cgcggtgctc	acggccgtgc	LCaagctCat	1860 1920
cgaccgatac gacctctacg gc gcctcacatc taccgcctcg cc	caygigge clacccaaag	, taccacaayo	cagetettat	1920
ggagccgttc ggcctcacaa tc	ategagge toctocttat	ggtttgccaa	tggtgqcqac	2040
caagaacggc gggccggtgg ac	atcctgaa ggcgctcca	aacgggctgc	tggtggaccc	2100
gcactcggcg gaagcgatca cc	ggcgcgct gctgagcctg	, ctggctgaga	. agtcgcggtg	2160
ggtggagtgc cgccgcaacg gc	ctccgcaa catccaccgo	: ttctcgtggc	cgcaccactg	2220
ccgcctctac ctctcccacg tc	tccaccta ctgcgaccaq	g ccctcgccgc	accagccgct	2280
ccgcgtgccc ctcgccctgg gc	tcctccac cagcttcgg	gccgacgact	cgctctcgga	2340

ggactccgcg gagctccggt ggccgtcgac cgacgcggcg cggcatgacc cttcgacgcg ggccgacgag	ggcctctcgc gccgccatca gccagggcgc tgctacggcg gtgtcggttg atccccgagg ctgatatgca gagtactccg aggctcggga tgccacgcct	tggacgcgct tcggcttcgc acgacggcaa gtgaatgcgc ccgcggaggc gcagcggggc ggcacgtcgc gcatggagga	ccgccggcgc gcccggccgg gcccgacgtc gggagcgaag gatcaaggca cgagctatgc gttccggtgg gatcgcctc	ccggcatccg cgggagagcc gagcagctga caggggtacg tgcggcgccg tacccgtgga cccggtgacc gcaatcgatc	agaagccggc tcctggtggt agaaggccat tgctgtcgac acgttgccag aggagctcgt acgtgaaatc ggcccgcctc	2400 2460 2520 2580 2640 2700 2760 2820 2880 2940
ctacttgtag	taaccactaa	ccagcacggt	acatggtctc	ctccatgcct	aagcttctga	3000 3060
tgcgtggggt	tttgggcagg tgcaacctcg	tctacacgcg	cacctacaca	cgcctcaacq	tcatccccct	3120
ctccacttcc	caaccacaca	ctctcaggta	cctgtcgata	cagtggggga	tcgatctctc	3180
caaggtggcg	gtgctcgtcg	gcgagaccgg	cgacaccgac	cgcgagaggc	tcctcccggg	3240 3300
agtgcacagg	acgctcatcc gggtacacca	tgccggggat	ggtcgcccgc	ggcagcgagg	ageteeteeg	3360
aggegaegae	ggctacacca	catccgacat	cctcaaggc	atctgagagc	atgctctgct	3420
ccttatacta	cctctatttt	ccacatcccg	gacgcagtag	ctccacttcg	attatttcac	3480
ctgtgatttt	ggcaggaaga	tgactgcaga	attgcatttg	catataccgt	atacctgtgc	3540
aagcatgagc	aaaacatgtc gtacatacta	agctaataat	tcttttatgt	cacaagaata	aaagagagaa	3600 3660
atattttcaa	tgtaagttga	tatttcttcc	tgacggcttc	ttacaatggc	ttgtctacat	3720
	aagaaaaaaa		3 33			3743
<210> 133 <211> 2714 <212> DNA <213> Loli	um perenne					
<400> 133			++ ~+ ~+ ~~+ ~	aggataget	accasactas	60
cttctcccct	cacacgcctc cagtctccgg	gagagagatta	ataccacett	ctcctcccat	cctaacgagc	120
tcattgccct	cttttcaaag	tatgttcacc	agggcaaagg	aatgcttcag	cgccaccagc	180
tgctcactga	gtttgaagcc	ttgtttgagg	ctgacaagga	gagatatgca	ccctttgaag	240
acattctccg	tgctgctcag	gaagcaattg	tgctgccccc	atgggttgca	ctggccatca	300 360
ggcctaggcc	tggtgtctgg	gactacatac	gggtgaatgt	tagcgagttg	gctgttgagg	420
agctgacagt	ttccgagtac gcttgagctt	gattttgagg	ctttcaatgc	ctccttccca	catccttcca	480
tatccaaatc	cattggaaat	ggggtgcagt	tccttaaccg	tcacctgtct	tccaagctgt	540
tccaggacaa	ggagagcctc	tacccactac	tgaacttcct	gaaagcccat	aaccacaagg	600
gcacgacaat	gatgctaaac	gaccgaattc	agagccttcg	tgggctccaa	tcagccctta	660
gaaaggcaga	agagtatcta	acgagcattc	ctgaagacac	cccgtcctct	gagttcaacc	720 780
acaggttcca	agagettgge ettgettett	catctacttc	greggggega	tccagccagc	ttggagaagt	840
tccttggaac	tataccaatq	atgttcaatg	ttgttatcct	gtctccacac	ggatattttg	900
ctcaatccaa	tgtgttggga	taccctgata	ctggtggcca	ggttgtgtac	atcttggatc	960
aagtccgtgc	tttggagaat	gagatgcttc	tgaggattaa	gcagcaaggc	cttgacataa	1020
cccctaagat	cctcattgtc	accaggctgt	tgcctgatgc	tgttggaact	acatgtggcc	1080 1140
agcggctgga	gaaagttatt	gggactgagc	ctcattttaa	tatataaca	ccattcagaa tacctggaga	1200
catacaccoa	gattettegt	aaguggatee	tgagagaaat	gcagaccaag	cctgatctca	1260
ttattggcaa	. ctacagtgac	ggtaaccttg	· tcgccactct	gcttgcgcat	aagttgggag	1320
ttacccaqtq	caccattgcc	catgctttgg	agaaaacaaa	ataccccaac	: tcagacatat	1380
atttggacaa	. attcgacago	caataccatt	. tctcatgcca	gttcactgct	gaccttattg	1440 1500
ccatgaatca	cactgatttc	atcatcacca	gcacattcca	ggaaattyct	ggaagcaagg taccgtgttg	1560
acagegraggy	tracritite	ratccaaatt	tcaacattgt	ctctcctqqa	gcagatatga	1620
ctatctactt	cccatacact	gaaactgaca	. agaggcttac	tgccttccac	cctgaaattg:	1680
aagagctcct	ttacagtgat	gttgagaact	. ctgaacacaa	. gtttgtattg	aaggacaaga	1740
acaagcctat	: catcttctca	. atggctcgtc	: ttgaccgtgt	. gaagaacatg	r acaggcttgg	1800
ttgagatgtt	tggtaagaat	gctcatctga	aggatttggc	: aaaccttgtg	attgtcgctg	1860 1920
gtgaccatgg	caaggagtcc	aaygataggg	aggagcaggc : atatcccctc	gateteaget	aggatgtaca cagatgaacc	1980
groccarriga	tocagagtto	taccactaca	tttgtgacac	caagggcgca	tttgttcagc	2040
ctgcattcta	tgaagcattt	ggcctgactg	ttgťcgaggc	: catgacatgt	ggtttgccca	2100

acatcgatcc ccacggcaga agaagtacac tctggaagta acgctctgaa cggacaatta tgatttgatt	atgccatggt ttaccacagt tccaacctac ctggaagctg tgtgagcaac gtaccgcagc gtgcgggaca gtctaccgga ctgtgaggtt aacgcctgcc aaaa	gacaaggctg tgggacaaaa tactcagaga cttgagaggc ctggctgctg tgaagaggcg gttttcattt ttgggcagtt	cagatatcct tgtcggaagg ggctgatgac gtgagactcg cagttccatt ccttcaaagg ggtctattgt ctttgctggt	ggtcaacttc tggcctgaag cctgactggt ccgttacctt ggccgtcgat gcgaggtgtc ggagtgtgta tcctgctagc	tttgagaaat agaatttatg gtatatggtt gagatgttct ggcgagaaca ggctgcgtta cttggatgtc tgcatatgtt	2160 2220 2280 2340 2400 2520 2580 2640 2700 2714
<210> 134 <211> 2957 <212> DNA <213> Loliu	ım perenne					
<400> 134						
cggtttcttc	ctcgtggtgc	gttgcgtttg	tcgggttctt	ctgaagaagc	ggaaggtttg	60
agcaatgggg	gaagccgccg	gcgaccgtgt	gctgagccgc	ctccacagcg	tcagggagcg	120
aatcggcgac	teceteteeg	cccaccccaa	tgagctcgtc	gccgtcttca	ccaggctggt	180 240
caaccttgga	aagggaatgc	tgcagcccca	ccagatcatc	gctgagtaca	tanaggang	300
ccctgaagca	gagcgcgaga atcgtcatct	agctcaagga	tagaettage	atcccccta	aggggcage	360
gcaggaggca	gtgagagtca	ccccargggt	acttactata	gaggagttga	atatacataa	420
ctgggagtat	ttcaaggaac	accttataa	accaaccaac	aaagacttcg	tacttaaact	480
gractitgag	ccattcaatg	cctccttccc	tcatccttcc	ctgtcgaagt	ccattggcaa	540
caatatacaa	ttcctcaata	gacacctatc	atcaaagctc	ttccatgaca	aggagagcat	600
gtaccetttg	ctcaacttcc	tccgtgcaca	caactacaag	ggcatgccta	tgatgatgaa	660
cgacagagtc	cgcagtctaa	gtgctctcca	gggagctctg	aggaaggccg	aggagcatct	720
gtctggtctt	ccagcagaca	ccccgtactc	ggacttccac	cacaggttcc	aagaacttgg	780
tttggaaaag	ggctggggtg	attgtgccaa	gcgtgcgcaa	gagacccttc	acctgctcct	840
cgaccttctt	gaggcacctg	acccgtccac	acttgagaag	ttccttggta	caatcccaat	900
ggtgttcaat	gttgtcatcc	tctctccaca	tggttacttt	gcacaagcca	atgtcttggg	960
gtaccctgac	accggagggc	aggttgtcta	cattttggat	caagtccgtg	ctatggagaa	1020
tgagatgctt	ttgaggatca	agcagcaagg	actcgatatc	acaccacgga	tccttattgt	1080
taccaggctt	ctccctgatg	caaccggtac	gacctgcggt	cagcgtcttg	agaaggtcct	1140
cggtactgag	cacacccaca	tccttcgtgt	gccattcaga	actgaaaatg	gaattgttcg	1200
caaatggatc	tcacgttttg	aagtctggcc	atacctggag	actttcactg	atgatgtggc	1260
gcacgagatt	tctggagagc	tccaggccaa	ccctgacctg	atcatcggaa	attacagtga	1320 1380
tggaaacctt	gttgcatgtt	tgcttgcaca	caagatgggc	gttactcatt	gtaccattgc	1440
gcatgcgctt	gagaaaacca ttctcatgcc	agtaccccaa	tanattantt	raciggaaga	agilligagga	1500
tcactaccac	agtaccttcc	agileaceae	tgacttgatt	gcaccatta	atcactacca	1560
gtgtgagatg	gcattcacga	tacctagaat	ggaaacaag	atccacaata	tcgatgtttt	1620
traccccaar	tttaacatag	tttcacctaa	tacaaacata	tccatctact	tcccgtactc	1680
agagtcacaa	aggaggctca	cctcactcca	cccagagatt	gaggagctgc	tctacagtga	1740
tgtcgacaac	gatgagcaca	agtttgttct	gaaggacagg	aacaagccaa	tcatcttctc	1800
gatggctcgt	ctggaccgtg	tcaagaactt	gactggtctg	gttgagctgt	atggccggaa	1860
ccctcqcttg	caggagcttg	ttaaccttgt	ggttgtttgt	ggtgaccatg	gcaacccatc	1920
aaaggacaag	gaggagcagg	ctgagttcaa	aaagatgttt	gaccttattg	aacagtacaa	1980
cctgaatggc	catatccgct	ggatctctgc	tcagatgaac	cgtgtccgta	atgctgagct	2040
ctatcgctac	atctgcgaca	ccaagggtgc	ttttgtgcag	cctgcattct	atgaggcttt	2100
cgggctaact	gtcatcgagg	ccatgacctg	tggtcttcca	acatttgcaa	ctgcatatgg	2160 2220
tggtccagct	gagatcatcg	tgaacggtgt	ctccggctac	tacattyate	accaecaggg	2220
tgacaaggcc	tcggctctgc atctcactgg	ccgttgagtt	cultgagaag	cgccagggag	cctagagact	2340
ctggaccaag	aggctgatga	gagggettea	tatatataaa	ttctggaagt	acotctccaa	2400
ccttacccgag	cgtgagaccc	accactacct	ggaaatgctg	tacgcgctca	agtaccgcac	2460
catagggagg	actgttccat	taactatcas	addagaaccc	tcgagcaagt	gatctggcca	2520
cctatcaacc	ggaagaagaa	gaagaaggtt	ggcttcgatt	tctgaaagat	ttgagatttg	2580
agaatgcgtt	ggttttcttc	ctagacacta	ctcttttaga	gttaaggtcq	agttgatgtg	2640
ctagtttgat	tcagcagtgg	gagtgagttg	agacagaagg	atgtggtgtg	tgccagtatt	2700
gttggtgctt	ttcgtgttct	ttggatgtta	cccttgaata	atagtagcgg	ccttggcgcc	2760
gtttctgaaa	taatagtagc	atccttgctc	gttgccaaga	aaatcttagt	ttttttttct	2820
cttgaacaag	tggcaaagcg	acctctgcat	ctatctctgt	cattgacatt	tagctctgtt	2880

gcggtgcact ggatacctta o	cattgctcta	gagaacagca	ataaaagccg	gaccatgtga	2940 2957
ctyctytaaa aaaaaaa					
<210> 135					
<211> 1986 <212> DNA					
<213> Festuca arundinad	cea				
<400> 135					
gaaacttctc atcccacagg	ccacagagca	tccccacaca	tcctatctcc	ctcctcgtgc	60
tecttetate accatagece a	aagcttgggc	cttcttcctc	ctcgccctct	tctccttctc	120
ctcctatgta tccaggatct t	tcctctgcag	caggaatggc	gagggatcct	tcctctgtgc	180 240
acgggcacca gaggtcccct ogcccacaag aactggatga	atgatcaaa	tgacaggtac	tactacaato	gcatctacca	300
tttattcttc cagcataacc	ccaatggccc	ccaatggggt	gacatagtct	ggggccattc	360
ggtttcgacc gaccttgtca a	actggatcat	acttgaaccc	gcaatagaac	cggatacacc	420
aggtgacata aaaggttgct	ggtccggctc	agccacagtt	atatctggta	gtcaaccggt	480 540
catcatgtac accggtggcg a gaaccggtct gacccgtacc	atgtagagaa	gaccaaggtt	tgcaataacc	cagtuctuca	600
accggttgga ccaggaatga	acccaggaacg	gttcagggat	ccgacgacag	gttggatcgg	660
gccggatgga ctatggagaa	tatcaattgg	agctgaggtg	aacggttaca	gtgcagcact	720
tttgtacaag agtgaagact	ttctgaattg	gagtagagtt	gatcacccac	tgtattcatc	780
cagtgcctcc actatgtggg	agtgcctgga	cttcttcgcg	gtattaccgg	gcagtaacgg	840 900
tggactggac ctgtccgcag ggatcaatgt gacaagtaca	tasttaggas	ttatcatctc	gaacatgatg	cttttatacc	960
tgatactatc ctcgatgacc	gttggttgtt	gccgaggatc	gattacggca	attactatgc	1020
ttcaaaatcg ttcttcgact	cgaaaaatag	gaggaggatc	atatggggtt	ggactaatga	1080
gtcagatagt tcttcagatg	atgtcgcaaa	aggctgggca	ggtatctatg	caattcccag	1140
gacaatttgg ctagaccgtg gtcccttcga agaaatgaaa	atggcaagca	gttgctgcaa	tggccagttg	aagagattga	1200 1260
tgagattaag ggagttgaca	ctttgcaggc	tgatgtggag	atagattttg	agctgacgtc	1320
tattgatgat gccgactctt	ttgatccttc	ctggcttttg	gatcccgaaa	agcattgccg	1380
ggaagcgggt gcatcagttc	atggtggtat	agggccattt	ggacttgtta	ttctggccac	1440
cggcgacatg gaggagcaca	ctgttgtgca	cttcagagtc	tacaaatcac	agaaagaata	1500 1560
catgatactc atgtgctctg tgcctatgga ggcttctttg	atataagaag	gtcttccctg	agacaaggac	ctctgagaac	1620
tctaattgat cggtcggcgg	tagagagett	taaaaacaat	ggcagggtct	gtatcatage	1680
tagagtttat ccagtggcga	ttgtcgatga	cgggagtgcc	cacatgtatg	ccttcaacaa	1740
tggaagtacc acggtcaggg	tgccacagat	cagggcatgg	agcatgatga	cagcacaagt	1800
gaatttaaag aaaggctgaa	gtgatgatta	acacagaaaa	gctaattcct	tttattgatt	1860 1920
ctttctctta ttcatgagca aattgattgt ttccttgatc	tcaattattc	atatactata	attattatta	aaaaaaaaaa	1980
aaaaaa	coddcaaca				1986
1010> 120					
<210> 136 <211> 2073					
<212> DNA			4		
<213> Lolium perenne					
<400> 136					
gaaaactaga ttattgtcca	gtctccttga	cttgcattaa	actttgcgat	ctggacggct	60
ataactgcgc cctgaaagcc	ttctgcaatt	tacacatcga	tcggccagcc	catccatcag	120
tacctttgtc ccctcttggt cgagcacccg ggcaatggcc	cttcctctcc	gattccgatt	cgcaccacca	attaccacaa	180 240
tgatcccaat gggccaatgt	accacaacgg	cctgtaccac	ttcttctacc	agtacaatcc	300
ccacggcccg acctgggaca	ccggcaagtt	atcatggggt	cactccgtct	ccggcgacct	360
catgaactgg gccgccctcg	acaatgctct	cgaccccacc	gccccgttcg	acgccaacgg	420
ctgctggtcc ggctccgcca	ccatcctccc	cggcggccgc	ccggccatcc	tctacaccgg	480 540
catcgacgcc gacaaggtgc gctcctccgc gagtgggaga	aggtgcagaa	caaccccctt	atcccatacc	ccaccascat	600
gacgggcaac aacttccgtg	atccgacgga	ggcgtggcgc	ggccgcgacg	gcctgtggcg	660
ggtcggcatc gtcgccgagg	tgaagggcgt	ggggtccctg	ctcgtgtacc	ggagcgcgga	720
cttcctccgc tggcagcgca	acgccgcgcc	gctgcacgcc	agctcgcggg	acgtgcccgt	780
gctggagtgċ ccggacctgt cgagacttcg gcaccgagcg	tcccggtggc	ragggggggg	ctcaagetea	cagacttcac	840 900
caaggaggac cactacatgg	ttgggtttta	cgacgacgtg	gcggacacct	tegtgeegge	960
22					

cgcgtccaag cgagaccgac gatgtggctg gctgcggagg ggagatcgcc	cgcggcgacg tccttctacg ggtggcggcg gacgccgacg aagcgggtcg ggcatcgtga gccgagacgt	acgcgcgcaa tcgccagggg ggaagcggct gcctgcggtg gctcgcaggc	caagcggcgc ctgggccggc ggtgcagtgg ggcgacggac ggacgtggag	atactgtggg atccaggcgt cccgtggagg gtggaggccg gtcgtgttcg	cgtgggtgga tcccgagggc agatcgagaa gcggcaggaa agatcccgaa	1020 1080 1140 1200 1260 1320 1380
ggcgaagggc cggtgacctg caaggttctc atcctatgga attgatcgat	gcgtccgtgc gaggagcaca atgtgcaccg gcatttcttg cacacggtgg	acggcggcgt ctgctgtgtt atctcacaaa atgtggacgt tggagagctt	cggcccgttc cttcagggtg gtcatctacg ggagaaggac cggcgacggc	gggctgctcg ttcaagcacg aaagcagggg aagttcatat gggaggacgt	atggcaagta cacacaagcc cgctcagaac gcatgacggc	1440 1500 1560 1620 1680 1740
gacaggtgcc cggcggctcg ctagggtatg ggtcgagtta	cccgaacacg gtaaaggtgt cttgcacccg cccgggatgg tgagtttcgg gacaaacatc	ccaaacttga tcgtcgtcaa tggctgctta gtaggatgat	ggcgtgggag ggcatccgac gatgatgtcc ttatgcggaa	ctggcgacgg cctaaagagg gtcgttgatt atgcaatttt	cggccgtgaa ccttgtagtt tatgcttgtt agtggcgtca	1800 1860 1920 1980 2040
	atagaggcat			J J	J	2073
<211> 1888 <212> DNA <213> Festi	ıca arundina	acea				
<400> 137						
	ttcagctcct	gccctccatg	gcccatgctt	gggccttctt	tctccttgcc	60
ctcttctcct	tctcctcctg	tgtgtccaag	ctcttcatct	acagcaggaa	tggcgaggga	120
tccttcctct	gtacacggtc	tccggaggtc	ccctccattg	ccagcaagag	gtacaggact	180
gcctaccact	tccagtctcc	caagaactgg	atcaatgatc	catgtggacc	catgtactac	240
aatggcattt	accatgaatt	ctaccagtat	aaccccggtg	gcaccatcgc	ggctaacata	300
gtttggggcc	attcggtttc	aaccgacctt	gtcaactgga	tccagcttga	acctgcaata	360 420
gtacgggata	ccccatatga	catacacggt	tgctggaccg	gctcaatcac	aattetaeet	480
ggtgatcagc	cggtcatcat	atacaccggt	tacctgactcgg	acaatcatca	agccaaaac	540
attgagctcc	ccaaaaaccg tcctaccggt	tagaccagac	ttgaacttga	cccagttcag	ggatccgaca	600
acceegagga	ttggaccgga	tagactatag	agaatagcaa	ttaatactaa	gctgaatggc	660
tacqqtqcq	cacttttgta	caagagtgaa	gactttctga	attggactag	agttgatcac	720
ccactgtatt	cagacaatgc	ccctcaatg	tgggagtgcc	cagatttctt	cgccgtattg	780
ccaggcaata	acggtggact	ggacctgtct	gcggcgatcc	cgaaaggcgc	caaacatgtc	840
ctcaagatga	gcgtggatta	ctctgacaag	tacatgattg	gggtttatga	tctcaaacgt	900
gatgcctttg	ttccggatgt	tgtcctagat	gaccgtcggc	tgtggttgag	gattgattac	960
ggcacattct	atgcttcaaa	atccttcttc	gactcgaaaa	ggggcaggag	ggtcatatgg	1020
ggttggtcca	acgagacaga	tagtgtttca	gatgatggtg	caaaaggttg	ggcaggtatc	1080 1140
catgcaatcc	ccaggtcaat ttgagtccct	taggitagac	agegatggca caaatcaacc	atcaaggggct	agaggtgaag	1200
accoracacc	tatttgagat	taaqqqaatt	gadaceddee	aggctgatat	tgaagtagat	1260
tttgaggtga	cgtccatcga	caacaccaat	ccttttgatc	cttcctaact	tttggatgtc	1320
gagaggcatt	gccgggaagc	aggtgcatcg	gttcaaggtg	gcatagggcc	atttggactt	1380
attatcctaa	catctaacaa	catggaggag	cacattgctg	tgcacttcag	agtttacaaa	1440
tcacagaaaa	gccacatgat	cctcatgtgc	tctgatctaa	gaaggtcttc	tctgagatca	1500
ggactgtaca	caccagccta	tggaggcttc	tttgaatttg	accttgaaaa	ggaaaggaag	1560
atatctctca	gaactctgat	tgatcggtca	gcggtggaga	gctttggcgg	cggtggcagg	1620
gtctgcataa	cggccaggat	ttatccagtg	gegettgteg	acggcagggt	ccacatgtat	1680 1740
gccttcaaca	atggaagtac tgaacgtgaa	taaggtcagg	agtgatadad	aacacacaca	gaycacyacy	1800
ttttcttaat	tagcgtactc	tcattcagga	gcactcctta	gtacaattga	aaggaaattc	1860
	agttggtcaa		. ,	J = = = = = = = = = = = = = = = = = = =		1888
2	_ 					
<210> 138 <211> 1849						

<211> 1849 <212> DNA

<213> Lolium perenne

<400> 138						
	catacttata	tecceatage	ccaaggttgg	cccttcttcc	tecttatect	60
cttctcctcc	tototatcca	accacctcgt	caatggagaa	agggtcttcc	tcttccccca	120
gtctcacaag	gtctcctcca	ttqtcaqcaa	gaggtatagg	actgcctacc	acttccagcc	180
ccccaagaac	tggatcaatg	gaccaatgta	ctacaatggt	atctaccatg	agttctacca	240
gtacaacccc	aatggctccc	tctggggtaa	cataatttgg	ggccattcag	tttcgacgga	300
cctcatcaac	tggatcccag	tagaacctgc	gatagaacgg	gatatcccaa	gtgacataaa	360
caattactaa	accggctcag	ccacaattat	ttccggtgat	caaccaatta	tcatatacac	420
cggagccgac	aaggagaacc	gtcagctcca	gaacattgtg	cttcccaaaa	acaagtctga	480
cccgtatctg	agggagtgga	caaaagcagg	taataacccg	gtgatccaac	cagtcgggcc	540
aggcttgaat	gcgagccagt	tcagggatcc	gacaaccggt	tggattggac	cggatggact	600
gtggaggata	gcagttggtg	ctgagcttaa	tggctacggt	gctgcacttt	tgtacaagag	. 660 . 720
tcaagacttt	ctgaattgga	ctagagttga	tcacccgctg	tattcatcca	atgeateete	720 780
aatgtgggag	tgcccagatt	ttttcgcggt	attgccggga	aacagcggcg	attactataa	840
atctgcagaa	atcccaaatg	gegeeaagea	tgtcctcaaa	tttataccaa	attactatatt	900
caagtacatg	accegageee	argarctgaa	aagtgatacc tcatggcaat	ttctatgccag	caaactcatt	960
agatgacegt	egacigiggi	agaggatega	atggggttgg	acaaatgaga	cadagecate	1020
ttcagattcat	addaayyyda	attagactaa	aatccatgca	attcccagga	caatatggtt	1080
agacyat	gregeadady	tactacaata	gccaattgaa	gagatcgagt	cccttcgaag	1140
agacagetae	accatcaac	gactagaget	gaagaaagga	gacctatttg	agattaaagg	1200
aactgacact	tcacagacta	atatagagat	agattttgag	ctgacatcca	ttgataatgc	1260
cgaccctttt	gatecttect	ggcttctgga	tgtcgagaag	cagtgccgag	aagcaggtgc	1320
atcogttcaa	gatagcatag	gaccatttag	acttgttgtc	ttggcctctg	acaacatgga	1380
ggagcacact	gctgtacact	tcagagttta	caaatcgcag	caaagctaca	tgatcctcat	1440
gtgttctgat	ctaagaaggt	cttccctgag	atcaggaatg	tacacaccag	catatggagg	1500
cttctttgaa	tttgaccttc	agaaggaaag	aaagatatct	ctgagaactc	tgattgatcg	1560
gtcagcggtg	gagagcttcg	gaggcggtgg	cagggtctgc	atcatggcca	gagtttatcc	1620
gatagtactt	gtcgatgatg	gcggggccca	catgtacgcc	ttcaacaatg	gcagtaccac	1680
ggtcagggtg	ccacagctca	gggcatggag	catgagcagg	gcagagcaca	agtgaatgta	1740
aagttaaagt	gatgattaac	atagaagagc	aaatctaatt	gacctgtgat	tggaggactg	1800
gaaaagtgat	ttaaatgctt	agcacaattg	tttcttgata	aaaaaaaa		1849
<210> 139 <211> 2166 <212> DNA <213> Loli	ım perenne					
<211> 2166 <212> DNA <213> Loli	um perenne					
<211> 2166 <212> DNA <213> Lolio	-	ntantotnac	agcaatgggg	attcatctca	ggagagtagc	60
<pre><211> 2166 <212> DNA <213> Loliv <400> 139 gggaccttgc</pre>	gcccaagtac	gtagtctgac	agcaatgggg cttgcagctc	gttegteteg	ggagagtagc cccatgtcgt	60 120
<pre><211> 2166 <212> DNA <213> Loliv <400> 139 gggaccttgc ttgggcgtgc</pre>	gcccaagtac ccggcggttc	tggtgctgct	cttgcagctc	gccggagcgt	cccatgtcgt	
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc	gcccaagtac ccggcggttc agcctcctcg	tggtgctgct agaccgaggc	cttgcagctc ggcggcggcc	gccggagcgt accgtgccag	cccatgtcgt cctccatttt	120
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc	tggtgctgct agaccgaggc acttccggcc	cttgcagctc ggcggcggcc tcagaagaac	gccggagcgt accgtgccag tggatcaacg	cccatgtcgt cctccatttt atcccaacgc	120 180
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct	120 180 240
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggc	120 180 240 300 360 420
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcga cccgacggca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggc ggccggacgt	120 180 240 300 360 420 480
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcga cccgacggca gtccagaacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggc ggccggacgt tcctccggga	120 180 240 300 360 420 480 540
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggt atcgtgtggg ctggcgca cccgacggca gtccagaacg ccggcgcaca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggc ggccggacgt tcctccggga acgcgacgca	120 180 240 300 360 420 480 540
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggt atcgtgtggg ctggcgca cccgacggca gtccagaacg ccggcgcaca ccgaccacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac	gccggagcgt accgtgccag tggatcaacg tacaaccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggc ggccggacgt tcctccggga acgcgacgca tggtgggcgc	120 180 240 300 360 420 480 540 600 660
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcac ccgacggca gtccagaacg ccggcgcaca ccgaccacgg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacggcac cgtgtaccgg	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtggcct ggccggacgt tcctccggga acgcgacgca tggtgggcgc tccggcggtg	120 180 240 300 360 420 480 540 600 660 720
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggeggttc agcctcctcg acegggtacc tacaagggtt atcgtgtggg ctggcgcac cccgacggca gtccagaacg ccggcaca ccgacacgg gcgtcccgcg cggaagccgc	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgcactcgc	cttgcagctc ggcggcggcc tcagaagaac gttcttcag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg gccgacgggg	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact atgtgggagt	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtcggcg ggccggacgt tcctccggga acgcgacgca tggtgggcgc tccggcggtg gcccggactt	120 180 240 300 360 420 480 540 600 660 720 780
<pre><211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc</pre>	gcccaagtac ccggeggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgccga cccgacggca gcccacacg gcgtccacgg gcgtcccgcg cggaagccgc accgtggacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtacgc cgtggtacgc gcgtggcgta tgcactcggc gcaaggagag	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg catgtacacg ggaccgggcac cgtgtaccgg gccgacgggg cggggtggac	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact atgtgggagt acgtccgtgg	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggcct cggggtcggc ggccggacgt tcctccggga acggacga tggtgggcgc tccggcggtg gcccggactt tgtccagctc	120 180 240 300 360 420 480 540 600 660 720 780 840
<211> 2166 <212> DNA <213> Lolin <400> 139 gggacettge ttgggegtge ctacgagace tgagetgage geegetgtae gtggggeaae gagaeggee gaceateatg caactacgag gttgeggaag gttceggga gttceggga ceteteegge gaegeggtt ctaceeggt gagggtgaag	gcccaagtac ccggeggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgccga cccgacggca gtccagaacg ccggcgcaca ccgaccacgg gcgtcccgcg cggaagccgc accgtggacg cacgtggacg cacgtgctca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg catgcccggag ggacgggcac cgtgtaccgg gccgacgggg cggggtggac cgacctccgc	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact atgtgggagt acgtccgtgg cgctacgact	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggcct cggggtcggc ggccggacgt tcctccggga acggcgcgcact tccggcggtg gcccggactt tgtccagctc actacaccgt	120 180 240 300 360 420 480 540 600 660 720 780 840 900
<pre><211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc</pre>	gcccaagtac ccggeggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa cccgacggca gtccagaacg ccggcaca ccgacacgg gcgtcccgcg cggaagccgc accgtggacg accgtggacg cacgtgctca gaccgtgtca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg gccgacgggg cggggtggac cgacctccgc cgtgccggac	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact atgtggagt acgtccgtgg cgctacgact acgtccgtgg	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggcct cggggtcggc ggccggacgt tcctccggga acgcgacga tgctggggcg tccgggcgt gcccggactt tgtccagctc actacaccgt gcgacaagca	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa cccgacggcaa gtccagaacg ccggcgcaca ccgaccacgg gcgtcccgcg cggaagccgc cggaagccgc accgtggacg cacgtgtcaa gaccgtgtcaa gaccgctga tacgactacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtagt cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg gccgacgggg cggggtggac cgactccgc cgtgccggac cgtgccggac	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca agccgcgact atgtgggagt acgtccgtgg cgctacgact acgtcgtgg cgctacgact accccgccg acgttctacg	cccatgtcgt cctccatttt atcccaacgc agggcgcgt gggtggcct cggggtcggc ggccggacgt tcctccggga acgcgacga tggtgggcg tccggcgtg gcccggactt tgtccagctc actacaccgt gcgacaagca accgtccaa	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020
<pre><211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc</pre>	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa cccgacggcaa gtccagaacg ccggcgcaca ccgaccacgg gcgtcccgcg cggaagccgc accgtggacg cacgtgtcta gaccgctga tacgactacg atcctgtggg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtagcgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta gatggcgaa	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg gccgacgggg cggggtggac cgacctccgc cgtgccggac cgcgtccaag cgagtccaag	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatcc agccgcgact atgtggagt acgtccgtgg cgctacgact accccgccg acgttctacg acgccgtcg	cccatgtcgt cctccatttt atcccaacgc agggcgcgt gggtggcct cggggtcggc ggccggacgt tcctccggga acggacgca tggtgggcg tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca accgtccaa acgacgtcga	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa cccgacggcaa gtccagaacg gcgtcccgcg cggaagccgc accgtggacg cacgtgtcca gaccgtgtca gaccgctga tacgactacg gcgcacac	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtagt cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta gatgggcgaa aggcgattcc	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccggg cggggtggac cgacctccgc cgacctccgc cgtgccggac cgtgccgaac cgcgtcaag cgggtcaaag cgagtccaag cgagtccgac	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggcatca agccgcgact atgtggagt acgtccgtgg cgctacgact aaccccgccg acgttctacg acgccgtcg tggctggacc	cccatgtcgt cctccatttt atcccaacgc agggegeggt gggtggcct cggggtcggc ggccggacgt tctccggga acggacga tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca accgtccaa acgacgtcga caagcggagg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa gccgacagca gccgacaca ccgaccacag gcgtcccgcg cggaagccgc accgtggacg accgtgtgacg accgtgctaa gaccgctga tacgactacg gcgcacacac	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta gatggcgaa aggcgattcc tggaggaggt	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg cggggtggac cgacctccgc cgacctccgc cgagtccaag cgagtccaag cgagtccaag cgagtccaag cgagtccaag cgagtccaac tcggaaggtt ggaggcgctc	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca atgtgggatc acgtccgtgg cgctacgact aaccccgccg acgttctacg acgccgtcg tggctggacc aggggaaca	cccatgtcgt cctccatttt atcccaacgc agggcgcgt gggtggccct cggggtcggc ggccggacgt tcctccggga acggacga tggtgggcgc tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca acccgtccaa acgacgtcga caagcgggag agccggtcag	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggtt atcgtgtggg ctggcgcaa gccgacagca gccaagaacg ccgaccacag gcgtcccgcg cggaagccgc accgtggacg cacgtgctaa gaccgctga tacgactacg gcggaatcacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct agaagggtaa gcaacttcta gatggcgaa aggcgattcc tggaggaggt agcggggaga	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg cggggtggac cgactccgc cgacctccgc cgagtccgac cgcgtccaag cgagtccaag cgagtccaac tcggaaggtt ggaggcgtc acacgtcgac	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatcc atgtgggatc acgtccgtgg gcgttacgact aaccccgccg acgttctacg tggctgcgtcg tggctgacc acgcgtcgtcg tgctggacc acgcgtcgt	cccatgtcgt cctccatttt atcccaacgc agggcgcgt gggtggccct cggggtcggc ggccggacgt tcctccggga acggacgat tcctggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca accgtccaa acgacgtcga caagcgtcga gaccggcag tacaaccgc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggt atcgtgtggg ctggcggcac ccgacggca gccacacgg gcgtcccgcg cggaagccgc accgtggacg accgtgtca gaccgtgtca gaccgtgta tacgactacg gcgcacacgg cacgtgctca gaccgtgtca gaccggctga tacgactacg gcggaatccg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccc acccggtgat cctggtacgc gcgtggcgta tgactcggc gcaaggagag agaacagcct agagagagta gcactcta gatggcgaa agcgattct tggaggaggt agcgggagag agcggggaga gcttcgaggt	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacgggcac cgtgtaccgg cggggtggac cgactccgc cggtgccgac cgcgtcaag cggtccaag cgggtccaag cgagtccgac tcggaaggtt ggaggcgtc acacgtcgac gcgagcctc	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc ggcggcatca tggcggatcc agccgcgatc atgtgggagt acgtccgtgg cgctacgact acgccgccg acgttctacg acgcgcgtcg tggctggacc agggggaaga gtcaccggcg gaggggagg	cccatgtcgt cctccatttt atcccaacgc agggcgcgt gggtggccct cggggtcggc ggccggacgt tcctccggga acggacgca tggtgggcgc tccggcgctt tgtccagctc actacaccgt gcacaagca acccgtccaa acccgtccaa acgacgtcgc caagcgggag agccggtcag tacaaacgc aggcggtag	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1260
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggt atcgtgtggg ctggcgcaca ccgaccgca gcccacacgg gcgtcccgcg cggaagccgc accgtggacg cacgtgctca gaccgtgtaca gaccgctga tacgactacg gcgcgcaca gaccggctga tacgactacg gcggaatgccacagg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttccg gctggcgta tcctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta gatgggcgaa agcggtgat agcggggaga agcttcgaggt cccagaagct	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcggac cgacaaatac catgtacacg cgtcccggag ggacgggcac cgttaccgg gcgacgggac cgtgtaccgg gcgacgggac cgactccgc cgtgccgaac cgactccgc cgtgcagac cgagtccaag cgagtccaag cgagtccaag cgagtccgac tcggaaggtt ggaggcgctc acacgtcgag gcgagcctg ttgcggcgtg	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctgtgt ggcgtcagcc tcggagcatca tggcggatcc agccgcgact atgtgggagt acgtccgtgg cgctacgact aaccccgccg acctctacg acgtctacgact acgccgtcgtcg acgtcgtagacc agggggaaga gtcaccggcg agggggaaga gtcaccggcg gaggggccgg aaggggcccg	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtggcct ggccggacgt tcctccggga acgcgacgca tggtgggcgc tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca acccgtccaa acgacgtcgc caagcgggag agccggtcag tacaaaccgc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1260 1320
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggcggttc agcctcctcg accgggtacc tacaagggt atcgtgtggg ctggcgac ccgacggca gtccagaacg gcgtccacgg gcgtcccgcg cggaagccgc accgtggacg accgtgtca gaccgtgatca gaccgctga tacgactacg gcgcacacg gcgcacacg gcgcacacg atcctgtgg gccggaatcc cagtggccg accgtgatgacg ccgatgctca gccggatgccacacg gccggatgcccacg	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgccggtgat tcgccttcca acccggtgac cctggtacgc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcaacttcta gatggcgaa agcgattcc tggaggaggt agcggggaga gcttcgaggt cccagaagct tgtgggtgct	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcggac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacggcac cgtgtaccgg gcgacggggcc cgactccgc cgtgccgaac cgactccaac cgagtccaag cgagtccaag cgagtccgac tcggaaggtt ggaggcgct acacgtcgac tcggacgtcg tcgcgactcg	gccggagcgt accgtgccag tggatcaacg tacaacccca ctcatcaact ggctgctgtgt ggcgtcagcc tcggaccctc ggcggcatca tggcggatca atgtgggagt acgtcgtgg cgctacgact aaccccgccg acgtctacgact acgccgtcgtcgtcg acgtcgtcg acgctacgacq acgccgcgacqacqacqacqacqacqacqacqacqacqacqacqacqa	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtggccgt tcctccggga acggacgca tggtgggcgc tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca acccgtccaa acccgtccaa acgacgtcgc caaggggga agccggtcag agccggtcag agccggtcag agcggtcag agcggtcag agcggtcag agggcggtga acgtggaggg agaggacgg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggeggttc agcctcctcg acegggtacc tacaagggtt atcgtgtggg ctggcgcaa ccgacggca gtccagaacg gcgtcccgcg cggaagccgc acegtggacg acegtggtca gaccgtgatca gaccgtgatca gaccgtgatca gaccgtgatga tacgactacg gcggaatcc cagtggccg ccggatggtga gccggatgatga gccggatgatga gccgacgccg cagtggtga gccggatgatga gccggatgatga gccaacgacg cggatggtga gccaacgacg gccttcggtc agggtgttca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgcggtgat tcgccttccc acccggtacc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcactcta gatggcgaa agcgcgattcc tggagaggt agcggggaga gctccagaaggt tgtgggtgc aggcgggaga gctccagaagct tgtgggtgcc aggccgcggg agtcatctt	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcgcgac cgacaaatac catgtacacg catgtacacg ggacgggcac cgttcccggag gccgacggggc cgacggggc cgactccgc cgtgccaag cgactccaag cgagtccaag cgagtccaag ggaggcgtc acacgtcgac gcgaggctc acacgtcgac ggcgtcgtcc caacgtcgac ggcgtcgtcc caacgtcgac gagctcgtcc caacgtcaac gacaagaac	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc agccgcgatca atgtgggatca acgtccgtgg cgctacgact acgtcgtgg cgctacgact acgtcgtgg cgctacgact accccgccg acgttctacg acgtcgtcg tggctgagac agggggaacc agggggaacc agggggaacc agggggaac cacgggc cagggggcgc cagggggcgc caggggcgcg caggggcgcc cagggcgcc ctgtaccacc	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtggccg ggccggacgt tcctccggga tcctgcggcgc tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca acccgtccaa acgacgtcgc caagcgggag agccggtcag tacaaaccgc aggcgctgga agggcgctggaggaggaggaggaggaggaggagggcccctcgtgct cgaccttcgc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
<211> 2166 <212> DNA <213> Lolin <400> 139 gggaccttgc ttgggcgtgc ctacgagacc tgagctgagc	gcccaagtac ccggeggttc agcctcctcg acegggtacc tacaagggtt atcgtgtggg ctggcgcaa ccgacggca gtccagaacg gcgtcccgcg cggaagccgc acegtggacg acegtggtca gaccgtgatca gaccgtgatca gaccgtgatca gaccgtgatga tacgactacg gcggaatcc cagtggccg ccggatggtga gccggatgatga gccggatgatga gccgacgccg cagtggtga gccggatgatga gccggatgatga gccaacgacg cggatggtga gccaacgacg cagtgtca gccatcgcg cagggtgta gccaacgacg gccatcgcg agggtgtca	tggtgctgct agaccgaggc acttccggcc ggtaccatct cgcactcggt gcatcgacgc cgcggtgat tcgccttccc acccggtacc gcgtggcgta tgcactcggc gcaaggagag agaacagcct aggagaggta gcactcta gatggcgaa agcgcgattcc tggagaggt agcggggaga gctccagaaggt tgtgggtgc aggcgggaga gctccagaagct tgtgggtgcc aggccgcggg agtcatctt	cttgcagctc ggcggcggcc tcagaagaac gttcttccag gtcgcggac cgacaaatac catgtacacg caagaacagc cgtcccggag ggacggcac cgtgtaccgg gcgacggggcc cgactccgc cgtgccgaac cgactccaac cgagtccaag cgagtccaag cgagtccgac tcggaaggtt ggaggcgct acacgtcgac tcggacgtcg tcgcgactcg	gccggagcgt accgtgccag tggatcaaccg tacaacccca ctcatcaact ggctgctggt ggcgtcagcc tcggaccctc agccgcgatca atgtgggatca acgtccgtgg cgctacgact acgtcgtgg cgctacgact acgtcgtgg cgctacgact accccgccg acgttctacg acgtcgtcg tggctgagac agggggaacc agggggaacc agggggaacc agggggaac cacgggc cagggggcgc cagggggcgc caggggcgcg caggggcgcc cagggcgcc ctgtaccacc	cccatgtcgt cctccatttt atcccaacgc agggcgcggt gggtggccct cggggtggccg ggccggacgt tcctccggga tcctgcggcgc tccggcggtg gcccggactt tgtccagctc actacaccgt gcgacaagca acccgtccaa acgacgtcgc caagcgggag agccggtcag tacaaaccgc aggcgctgga agggcgctggaggaggaggaggaggaggaggagggcccctcgtgct cgaccttcgc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500

atccgtcgtg gagagctttg gtcgctcgcc attggcagga caaggtgtcg cggctcacgg gatttagatt caggcaggag tcaggcatgc gtctggggcg ttttacaagg gcgcgtacgt itttgtatgc ccccgggaat aagttatttt tctgaaacgg taaaataagg agcaacaaag aaaaaa	acgctcacct cgtgggaaat caccatatgc ttattctgat agctagctag aataaagatc ggcaaaatat	ccacgtcttc gaagaagccg atgattccta gttaatttga gtttgcacgc catgcatagc ttgctccaat	aacaacggca gcgctcatga catatgtgct cctctggtga tgtgtaagtg ctgaggtggg caactactcc	aggcggacat acggtgccta tgaatttggc aacatgctag aagggggtca catcggtaga tggcatggat	1680 1740 1800 1860 1920 1980 2040 2100 2160 2166
<210> 140 <211> 2137 <212> DNA <213> Lolium perenne					
cactegeact agtegeega cacagattet atgecaatgg cetgeegag gacgeegagg egeagegttg catgacgte ageggaggte catgacgag gacgeegagg gacgeegagg egeagegge aaeggeegagg gacgeegagggegaeaegaegggggggggg	aggcaagaga cagcggtggt tggtcgccgc ctgccggggg gagggcctga tgctgggggc agcgcaccgg tctactacaa gcaacaagat ccatcgccat ccgtgctccc aggtccagt agtatgaggg acccgaccac aggataaccg agctcgttcc tgtacccggt acagcggtga cagcggtga cagcggtga cagcggcga tagataccaa gtaccaactc gtctccaccg tcgtggagc gggacaccga tcgttggcag cagcgcact tcgttggcag cagcacct tcgttggcac acccgactga cccggatga cccgacga cggacaccga cccgacga cccgacga cccgacga cccgactga cccgacga cccgactga cccgacga cccgacta acccgactga	tggcgtctcg tgggcgcggt gctccttgcc cgtcgtcatg gtcaggcgtg cgacgcggc cttccacttc ggggtgggc gttccccgac cgacggcgc cctcgccttc caacccggtg tgcatggtac ccgaggcgc tgcatggtac cgacggcgc tggagtgctg tggcggcgc tggcggcgc tggcggcgc tggcggcgc tggcggcgc tggcgagtcgg tggtgaagt gctagggagg ggccaagaag cgtggccaag gacggcaaccac aaaggaggcc caccaatctc ggccacacaca tgccaacaca tgccaacaca tgccaacaca tgccaacaca tgccaccatgac catcgagac cgccaccatgac catcgagac cgccaccatgac cgccaccagt ggccaccattac tgccaccagt	atgccctact cgccggaccg gtcgccgcgc cccaaccacc tcggagaaga agcaacgcgt cagcccgaga cacctcttct catgccgtgt cagtggtacg atcgtcatgc cctccgacc ctgtacccgc gatggcttga caccgggtt tagcatgtca tacgatgtca tacgatgtaca gagggcattg ttggatgtacg aggcgtgtgc ggatgggctt aaccttatcc ggaggacatca ctcgacatcg gatggctt taccttctcgacc tttggcctcg cgatggct tttggcttgc gtctacttct gagcacacgg gtcgcacagg gtccacagg gccaatgccg ctcgtcgcc	cgtatgcggc ggcctctgtt tggctggcagt cgatggaagt cgtccggggag agaactggaa accagtacaa cccgggacat acatcaacgg tctacaacgg cctccgaccc ctccgcacgt atggaatgtg cctacaagac cggcgacgga acatggaagag acatgggacaaaaaa tatggggaga tgaaggagag cgacaggacag	60 120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740 1800 1980 2040 2137
<210> 141 <211> 1954 <212> DNA <213> Lolium perenne					
<pre><400> 141 gaaagettte ttteetgttt acatgeatge agateceaac agtacaacee egagggggeg acctagteea etggegeeac aeggtgtetg gaeaggetee eggggteeae eaatgeetee</pre>	gtccggtct gtctggggca ctcccgctcg gccaccgtgt	attaccgcgg acatcgcgtg ccatggtgcc tccccgatgg	atggtaccac gggccacgct tgaccagtgg gaccctgaac	ctcttctacc gtctctcggg tacgacatca atgctctaca	60 120 180 240 300 360

						400
actccctcct	ccacaactaa	accaagcacg	aagccaaccc	ggtcctcctc	ccaccgcccg	420
		cgtgacccaa	aasaaaata	attenacaaa	tctcaccaca	480
ggalcgglga	Caaggacttc	cytgacccaa	ccaccycaty	greegacgag	cccgaccaga	
cgtggcgcac	cgtcatcggg	tccaaggaca	acaacggcca	cgccggcatc	gccatggtgt	540
acaadaccaa	agacttcctc	aactacgagc	tcatcccggg	atacttgcat	cacatcaaca	600
acaagaccaa	agactecte				222222	660
gcaccggcat	grgggagrge	atcgacttct	acceccytegg	cyycaayaac	ggcagcgagg	
agctgtacgt	gatcaaggag	agcagcgacg	acqaccqaca	tgactggtac	acgctaggga	720
	2. 22.22	acgttcacgg	ccacaasccc	udadaacdac	ctagggattg	780
aatacgacgc	ggcagccaac	acguicacgg	ccgcggaccc	ggagaacgac	ccagggaccg	
ggctgaggta	cgactggggc	aagttctacg	cgtccaagac	cttctacgac	ccagccaaga	840
accacacat.	actatagga	tggattggcg	agaccgactc	casacacacc	gatgtcgcca	900
ageggegege	,900909999	cggaccggcg	agaccgacca		sees act and	960
agggatgggc	atccctcatg	tcgattccga	ggacggtgga	getegaegag	aagaeetgga	
ccaacctcat	ccaatggcca	gtggaggaga	tcgagaccct	ccgcatcaag	tccaccgacc	1020
		cacggcagcg	tatagggagt	coctatacas	cacaccacac	1080
riggiggear	Caccattgac	cacggcagcg	tetacecace	CCCCCCCCC	cgcgccacac	
agctagacat	cgaggcctcc	ttccgcctcg	acgccgccac	cgtcgccgcc	ctcaacgagg	1140
at an aat naa	ctacaattac	agcaccagcg	acaactctac	ccaccacaac	acactegace	1200
Cigacgiagg	Clacaallyc	agcaccagcg	geggeeeeae	ccaccgcggc	gedeceggee	
cctttggcat	cctcgtcctt	gccgacggta	aggcggagca	aacggcggtg	tacttctatg	1260
tatacaaaaa	ccttgacggg	gccctcgaga	cccacttctq	ccacgacgag	tcacaatcaa	1320
cgcccaaggg	ccccgacggg	gooocogaga			at acat acat a	1380
cgctggccaa	ggatgtcgtg	aagcgagtgg	tgggatacac	egrgeergre	cicgaiggig	
aggcattttc	catagaaata	ctcgtggacc	actcaattgt	ggagagette	accatagata	1440
aggoattette			acadacata	tatataraa	actactaata	1500
gaaggtccac	ggcgacgicg	agggtgtacc	egaeggagte	Lattiatyge	gergerggrg	
catatctttt	caacaatgcc	accggcggct	ccgtgaccgt	tgagaagctc	gtggtgcatg	1560
agatgaagtg	atactacaac	cagatettea	taactaacaa	cttataatca	ccatcatcca	1620
agatggactc	gecetacaac	cagaccccca	eggetgaega	cccgcagcca		
tggatagcgt	cggatggtga	ggatgatcac	ctactacata	tacatacata	ctattgatcg	1680
aacdatcacc	agategatea	gtggtggctt	cctctttctc	ttggatgcag	aaggagatgg	1740
aacgatcacc	ggacoggcog	929929922			***	1800
agtactagct	actctattta	ccatgttgtt	gttttgttgg	ttttttgggg	LLLGGGLLLL	
tgacgagatg	gatgaattag	ctatagatgg	atgattgtgt	cctattttct	ctcctqcctt	1860
egaegagaeg			~~t~~t~~	atattaasta	agagtgatga	1920
ccgagtgtaa	ctacatatat	tggcaggatc	gargaratee	Clyclycaty	acagigacga	
ttaattatto	tgatgatatt	gatcaaaaaa	aaaa			1954
• • • • • • • • • • • • • • • • • • • •	- 9 9-	2				
			*			
<210> 142						
<211> 2039						
<212> DNA						
<213> Loli	um perenne					
	E					
<400> 142						
	aasaasaasa	usastcccuu	ccaccattcc	tccaccttcc	actecgacca	60
aggaggtggt	ggaggagcac	gaaatcccgg	ccgccattcc	tccaccttcc	gctccgacca	60
aggaggtggt aagatttcca	tccggcgaga	tccatgggct	ccatcgcggc	agacttggcg	ccggaggcgc	120
aggaggtggt aagatttcca	tccggcgaga	tccatgggct	ccatcgcggc	agacttggcg	ccggaggcgc	
aggaggtggt aagatttcca ccgcggagct	tccggcgaga ggtgttccgg	tccatgggct tcgaagctcc	ccatcgcggc cggacatcga	agacttggcg gatcccgacc	ccggaggcgc cacctgacgc	120 180
aggaggtggt aagatttcca ccgcggagct tgcaagacta	tccggcgaga ggtgttccgg ctgcttcgag	tccatgggct tcgaagctcc cgcctgccgg	ccatcgcggc cggacatcga agctctccgc	agacttggcg gatcccgacc ccgcgcctgc	ccggaggcgc cacctgacgc ctcatcgacg	120 180 240
aggaggtggt aagatttcca ccgcggagct tgcaagacta	tccggcgaga ggtgttccgg ctgcttcgag	tccatgggct tcgaagctcc cgcctgccgg	ccatcgcggc cggacatcga agctctccgc	agacttggcg gatcccgacc ccgcgcctgc	ccggaggcgc cacctgacgc ctcatcgacg	120 180
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg	120 180 240 300
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact	120 180 240 300 360
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg	120 180 240 300 360 420
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg	120 180 240 300 360
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg ctacacgccc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg	120 180 240 300 360 420 480
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg ctacacgccc cgaggcctgc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcg	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgccgcc cgccgcggcc cttcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga	120 180 240 300 360 420 480 540
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg ctacacgccc cgaggcctgc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcg	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgccgcc cgccgcggcc cttcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga	120 180 240 300 360 420 480
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac	tccggcgaga ggtgttccgg ctgcttcgag cgccgcgctc ccgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccqtcgac	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcg acgacggctg	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc ctcgcgcgcc cttcgccgcc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc	120 180 240 300 360 420 480 540
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacgctg tcgacgaggc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcgc cttcgcggc cctcccgttc ggtcgaccc	ccggaggcgc cacetgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg	120 180 240 300 360 420 480 540 600 660
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgc tccccgtcgt tcctcgggga	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcgc gtactcgtcc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg ggcaccaccg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacggctg tcgacgaggc gcctgccaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgccgcggcc cttcgccgcc cctcccgttc ggtcgaccc ggcgctcatg	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc	120 180 240 300 360 420 480 540 600 660 720
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgc tccccgtcgt tcctcgggga	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcgc gtactcgtcc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg ggcaccaccg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacggctg tcgacgaggc gcctgccaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgccgcggcc cttcgccgcc cctcccgttc ggtcgaccc ggcgctcatg	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc	120 180 240 300 360 420 480 540 600 660
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tggcgctcgc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggcgttcg gagcggttcg ggcaccaccg gcccagcagg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacggctg tcgacgaggc gcctgccaa tggacggtga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcgccgcc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca	120 180 240 300 360 420 480 540 600 660 720 780
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tggcgctgcc gcagcctcgt	tccggcgaga ggtgttccgg ctgcttcgag cgccctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg ggcaccaccg gcccagcagg tgcgtgctgc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc tcgacggctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcccgttc ggtcgaccc ggcgctcatg gaacccgaac catctactcg	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagaggga gcggcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg	120 180 240 300 360 420 480 540 600 660 720 780 840
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tggcgctgcc gcagcctcgt	tccggcgaga ggtgttccgg ctgcttcgag cgccctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg ggcaccaccg gcccagcagg tgcgtgctgc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc tcgacggctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcccgttc ggtcgaccc ggcgctcatg gaacccgaac catctactcg	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagaggga gcggcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg	120 180 240 300 360 420 480 540 600 660 720 780
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccggga tgcgctcgc gcagctccgt gctcgtcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc cgtgctgctg cggtttacgc	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gagcggttcg ggcaccaccg gcccagcagg tgcgtgctgc gccgggtgcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc tcgacgaggc gcctgccaa tggacggtga cgctgttca cgatcgtgat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcgccgcc cctcccgttc ggtcgaccc ggcgctcatg gaacccgaac catctactcg catgcgcaag	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagggga gccgcgact gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg	120 180 240 300 360 420 480 540 600 660 720 780 840 900
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtgga tgcgctgcg gcagcttcgt gctcgtcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg ggcaccaccg gccaccaccg tcgggtgctgc gccgggtgcg gccgggtgcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acggctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtgtat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcgccgcc cctcccgttc ggtcgaccc ggcgctcatg gaacccgaac catctactcg catgcgcaag ggcgcattc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgcaagg gagagggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tgcgctgcc gcagcctcgt gctcgtccga	tccggcgaga ggtgttccgg ctgcttcgag cgccgcctc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg gatcgcaag	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gagccgtcg ggcaccaccg gcccagcagg tcgggtgctgc gccgggtgcg agcgcgcacg agcgcgcacg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggcg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtgatgatgatgcgctgat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catgcgcatc ggcgcattc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgcaaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatcggc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tgcgctgcc gcagcctcgt gctcgtccga	tccggcgaga ggtgttccgg ctgcttcgag cgccgcctc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg gatcgcaag	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gagccgtcg ggcaccaccg gcccagcagg tcgggtgctgc gccgggtgcg agcgcgcacg agcgcgcacg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggcg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtgatgatgatgcgctgat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catgcgcatc ggcgcattc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgcaaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatcggc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgc gcagcctcgt gctcgtccga tgctgctcgc tcctggtga tgctgtcga	tccggcgaga ggtgttccgg ctgcttcgag cgccgcctc cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtcc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg gatcgcaag gggggggggg	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gagccgtcg ggcaccaccg gcccagcagg tgcgtgctgc gccgggtgcg cgcgcgcacg agcgcgcggg cccatgggcacg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtgatcgagt tgaccgcgagtgat	agacttggcg gatcccgacc ccgcgcctgc catggcgctc cggcgcgcc cgccgcgcc ctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catggcgattc ggacctgcaag ggcgcattc ggacctggcg ggacctggcg	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatcggc atggccaaga	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctccg gcagcctcgt gctcgtccga tgctgtccga tgctgttcca tcgtggtga tgctgtccga tgctgtccga tgctgtccga tgctgttcgct	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgc ggacctggt ggacctggt ggacctggtg gatcgcaag ggggcggcg tgtgctcggg	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg ggcaccaccg gcccagcagg tgcgtgctgc gccgggtgcg cgcggcgcacg agcgcgcacg agcgcgcacg agcgcgcacg catgggca cagggatatg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcg acgacggctg tcgacgaggc gcctgccaa tggacggtgc cgatgttcca cgatcgtgat gcgtgttcca cgatcgtgat gcgtgatcacggt aggagctgca aggagctgca aggagctgca ggatgaccga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc ctcccgttc ggcgcccc ggcgtcatg gaacccgaac catctactcg catggcgattc ggcgcattc ggacctggcg catggcgcattc ggacctggcg	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccgg atggccaaga gtgctagcca	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgc gcagcctcgt gctcgtccga tgctgctcga tgctgtccga tgctgtccga tgctgtccga tgctgttcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc ggacctggt ggttacgc ggacctggt gatcgccaag ggagcggcg tgtgctcggg cttcgccaag	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg ggcaccaccg gcccagcagg tgcgtgctgc gccgggtgcg cgcggcacg agegcgcacg agegcgcacg agegcgcacg agegcgcacg agegcgcacg gaggatatg gagccgttcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacggctg tcgacgaggc gcctgccaa tggacggtgcccacgatgtcca cgatcgtgat gcgtgttcca cgatcgtgat gcgtcacggt tgaccgcgc aggagctgca aggagctgca aggatgaccga aggtcaagtc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgccc ctcccgtc ggcgcccc ggcgcccc ggcgtcatg gaacccgaac catctactacg ggcgcattc ggacctggc ggacgcgttc ggacctggc	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccgg atggccaaga gtgctagcca ggcaccgtcg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgc gcagcctcgt gctcgtccga tgctgctcga tgctgtccga tgctgtccga tgctgtccga tgctgttcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc ggacctggt ggttacgc ggacctggt gatcgccaag ggagcggcg tgtgctcggg cttcgccaag	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg ggcaccaccg gcccagcagg tgcgtgctgc gccgggtgcg cgcggcacg agegcgcacg agegcgcacg agegcgcacg agegcgcacg agegcgcacg gaggatatg gagccgttcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc acgacggctg tcgacgaggc gcctgccaa tggacggtgcccacgatgtcca cgatcgtgat gcgtgttcca cgatcgtgat gcgtcacggt tgaccgcgc aggagctgca aggagctgca aggatgaccga aggtcaagtc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgccc ctcccgtc ggcgcccc ggcgcccc ggcgtcatg gaacccgaac catctactacg ggcgcattc ggacctggc ggacgcgttc ggacctggc	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccgg atggccaaga gtgctagcca ggcaccgtcg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tggcgctgcc gcagcctcgt gctcgtccga tgctgtccga tgctgtcgc tcgtggtggt tcgtcgc tcgtcgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc ggacctggt gggctgcggt gatcgccaag ggggggggg tttgctcggg cttcgcaag cgagctcaag cgagctcaag	tccatgggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gaccaccacg gcccagcagg tgcgtgctgc gccgggcgcacg cgcgcgcacg acgggcgcacg acgggcgcacg acgggatatg gccatggga ccatgggca cagggatatg gagccgttcg atcgtcgacc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgacgc gcctgccaa tggacggtga cgctgtcca cgatcgtgt cgacggtga cgctgtcca cgatcgtgat gcgtcacggt aggacgcgc aggagctgca aggaccgca aggaccgca	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgccc ctcccgttc ggcgcccc cgcgcgccc cgcgcgccc ctcccgttc ggcgcattc ggacccgaac catctactcg catgcgcattc ggacctgcc tggaccttc cggcgccct cgccgcccc tggccccc tggccccc	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgccaagg gagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca ggcaccgtcg ggcccaacc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctccgt gctcgtccga tgctgtccga tgctgtccga tgctgtccga tgctgtccga tgctgtccga tgctctcgt tcgtggtggt tcgtcggctgcc gcgctttggt tcgtggtgga tggtcctaggc tccccaacgc tgccggaacgc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcttcgtg ctacacgccc cgaggcctg ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg gatcgcaag ggggggggcg tgtgctcggg cttcgccaag ggggctggct ggtctcgga agaaagctaaag cgagctcaag ggatctaag ggatctaag	tccatggct tcgaagctcc cgcetgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgaga gaggccgtcg gagcggttcg gcacaccac gcccagcagg tgcgtgctgc gccggcacg acgcgcgcac agggatatg gagccgttcg accactggca ccatgggca cagggatatg gagccgttcg gagcggtccc cagggatatg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgccaggc acgacgctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtcacggt tgacggccg aggagctgca aggagctgca ggatgacgga aggagctgca aggagctgca aggagctgca aggagctgca aggagctgca aggatcacga agatcacga agatcacga agatcatgaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc ctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catggcaag ggcgccattc ggacctgcg ggacctgcc cgccgcgctcatg gaacctgcaag ggcgccattc ggacctgcc cgccgcctcctc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagggga gccgcgactc gacgacttca ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca ggaccgtcg ggccgcaacc acggcacca	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260 1320
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctccgt gctcgtccga tgctgtccga tgctgtccga tgctgtccga tgctgtccga tgctgtccga tgctctcgt tcgtggtggt tcgtcggctgcc gcgctttggt tcgtggtgga tggtcctaggc tccccaacgc tgccggaacgc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcttcgtg ctacacgccc cgaggcctg ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg gatcgcaag ggggggggcg tgtgctcggg cttcgccaag ggggctggct ggtctcgga agaaagctaaag cgagctcaag ggatctaag ggatctaag	tccatggct tcgaagctcc cgcetgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgaga gaggccgtcg gagcggttcg gcacaccac gcccagcagg tgcgtgctgc gccggcacg acgcgcgcac agggatatg gagccgttcg accactggca ccatgggca cagggatatg gagccgttcg gagcggtccc cagggatatg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgccaggc acgacgctg tcgacgaggc gcctgccaa tggacggtga cgctgttcca cgatcgtgat gcgtcacggt tgacggccg aggagctgca aggagctgca ggatgacgga aggagctgca aggagctgca aggagctgca aggagctgca aggagctgca aggatcacga agatcacga agatcacga agatcatgaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc ctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catggcaag ggcgccattc ggacctgcg ggacctgcc cgccgcgctcatg gaacctgcaag ggcgccattc ggacctgcc cgccgcctcctc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcgg ctccgcaact accaccaccg ggcgccaagg gagagggga gccgcgactc gacgacttca ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca ggaccgtcg ggccgcaacc acggcacca	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1260
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt gctctcggga tggcgctcgt gctcgtcgc gcagcttcgt tcgtgctcgc tcgtgctcgc tcgtcgctcgt tcgtgctcgc tcgtgctgct tcgtggtga tggtcatgtc tcccaacgc tccggagga aggccacaa	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcctcgtg ctacacgccc cgaggcctg ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg ggacctggtg cgtgctgcg gatcgcaag gggggcggcg tgtgctcggg cttcgcaag ggggcgagc tgtgctcaag gagctcaag gagctcaag gatctgcatc gaacaccatt	tccatgggct tcgaagctcc cgcctgcgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgaga gagccgtcg gagcgttcg gcacaccag gcccagcagg tgcgtgctgc gccggcgcacg agcgcgcgg cccatgggca cagggattcg gagcgttcc gcgggcacg agcgcgcggg cccatgggca cagggattcg gagcgttcg gagcgttcg gagcgcgcg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggct accgccaggc acgacgctg tcgacgaggc gcctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgacgccgc aggagctgca ggatgacgca ggatgaccga aggagctgca ggatgaccga aggatcacga aggtcacgga aggtcacgga aggtcacga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgccgcgcgc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catggcaat ggcgcattc ggacctggcg cgccgcgcct cgccgcgcct catgcgaac catctactcg catgccaac catctactcg catgccaac catctactcg catgccaac catctactcg catgccatc cggacctgcct cgccccct cggctcctc aggttaccta tactggagac	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcagc ctccgcaact accaccaccg ggagagaggga gccgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc atgatccgg atggtagca	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgctcgt gctgtccgt gctgtccgt gctgtccgt tcgtgctcgc tcgtgctgct tcgtggtga tggtcatgtc tcccaacgc tcccgaggga tggtcatgtc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcttcgtg ctacacgcc cgaggcctg ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg cgtgctgcg cgtgctgcg cgtgctgcaag ggagcggcg tgtgctcaag cgagctcaag cgagctcaag cgagctcaag gatctgcat cgaacacatt cgacgagatc	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgaga gagccgtcg gagcgttcg gcacaccg gcacacacg gcccagcagg tgcgtgctgc gccggcgcacg agcgcgcgcac agcgcgcgcac agcgcgcgc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgccaggc acgacgctg tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgccga aggagctgca cgatgacgcg agatgaccga aggtcaaggt aggtcaaggt aggtcaaggt aggtcaaggt aggtcaaggt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggactgaa aggtcaagt aagtcaagt aagtcatgaa gttggctgca acagactgaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgccgcggcc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catgcgcatc ggacgcattc ggacctggcc ctcgccgtc aggccattc ggacctgcgc tggccgct tggccgcgc tggccatc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcagc ctccgcaact accaccaccg ggcgccaagg gagagaggga ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgcccca tcgatccggc atggccaaga gtgctagcca ggcaccgtcg ggcccacacc atgatccgg atggctagcca atggcaaccg atggtagcca atggtaagca ggcaccgtcg atggtaacca atgatccgg attggttatg aatataagg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgctcgt gctgtccgt gctgtccgt gctgtccgt tcgtgctcgc tcgtgctgct tcgtggtga tggtcatgtc tcccaacgc tcccgaggga tggtcatgtc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcttcgtg ctacacgcc cgaggcctg ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cgtgctgctg cggtttacgc ggacctggtg cgtgctgcg cgtgctgcg cgtgctgcaag ggagcggcg tgtgctcaag cgagctcaag cgagctcaag cgagctcaag gatctgcat cgaacacatt cgacgagatc	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgaga gagccgtcg gagcgttcg gcacaccg gcacacacg gcccagcagg tgcgtgctgc gccggcgcacg agcgcgcgcac agcgcgcgcac agcgcgcgc	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgccaggc acgacgctg tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgccga aggagctgca cgatgacgcg agatgaccga aggtcaaggt aggtcaaggt aggtcaaggt aggtcaaggt aggtcaaggt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggtcaagt aggactgaa aggtcaagt aagtcaagt aagtcatgaa gttggctgca acagactgaa	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgccgcggcc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catgcgcatc ggacgcattc ggacctggcc ctcgccgtc aggccattc ggacctgcgc tggccgct tggccgcgc tggccatc	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcagc ctccgcaact accaccaccg ggcgccaagg gagagaggga ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgcccca tcgatccggc atggccaaga gtgctagcca ggcaccgtcg ggcccacacc atgatccgg atggctagcca atggctagcca atggtaagca ggcaccgtcg atggtaacca atgatccgg attggttatg aatataagg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1200 1320 1380
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcat tcctcggga tgcgctcgt gctgctcgt gctgtccga tgctgctcgt tcgtggtgga tggtcatgtc tcgcgaggtga tggtcatgtc tcgcgaacgc tccgaacgc tccggaacgc tcggaacgc tgcggaacgc tgcggaacgc tgcggaacgc tgcggaacgc tgcggaacgc tgcggaacgc tgcggaacgc	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgcttcgtg ctacacgcc cgaggcctgc ctccgtcgac ctccgtcgac cacaagcgtc cgtgctgctgcgactcgtgctgcggttacgc ggacctggtg cgtccaag ggacctggtg ctcgccaag ggacctaggg cttcgccaag cgagctcaag gatctgcaag cacacatt cgacagagtc cgagatcaag cacaccatt cacaccatt	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggcgttcg ggcaccaccg gcccagcagg tgcgtgctgc gccggcacg agcgcgcacg agcgcgcacc agcggcatatg gagccgttcg cacgagatatg gagccgttcc cgcggcaagc tttattgtcg gaacttgaag	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgacgctg tcgacgacgctg tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgcga aggagctga cgctaccga aggagctga cgctaccga aggactgaa gcgtaacga agatcacga agatcacga agatcacga acgacaccga acccaccga acccaccga acccaccga acccaccc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgcgcggcc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catgcgcaag ggcgcattc ggacctgcgc cgccgccc tggccgccc tggccgccc tggccgccc tggccgccc tggcccctcctc aggttaccta tactgagac ggagataatc tacgcacct	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcagc ctccgcaact accaccaccg ggcgccaagg gagagaggga gccgcaact cacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca ggcaccgtcg atgctagcca ggcaccgtcg gaccgtagcca aggcaccgtcg gaccgcaacc gatcggtaacc gattggttatg aaatataagg gaaatcaagg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgt gctgctcgt gctgctcgt gctgctcgt tcgtggtgc tcgtgctcga tgctgctcgc gcagcctcgt tcgtggtgca tgctgctggc tcgtgctaggt tcgtggtga tggtcatgtc tccccaacgc tgccggagga aggccacaaa tcgatgatga gattccaggt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctacag gacctggtg gacctggtg gatcgcaag gatcgcaag cgagctcaag gatctgcaac cgagctcaac cgagctcaac cgagctcaac cgagctcaac cgactcaat cgacgagat cgacgagat cgacgagat cactccagca cgtatcgat	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggcgttcg ggcaccaccg gcccagcagg tgcgtgcg cccagcagg tccggggaccg agcgcgcgcacg agcgcgcgcac agcgcgcacg atcgtcgac ccgggatatg gagccgttcg atcgtcgac ctgggcacc acggatatg gatcgtcgac acggcacc acggatatg gatcgtcgac caggatatg gatcgtcgac caggatatg gatcgtcgac caggacacg acaaggacac gacaagacg	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggccaggc acgacgcgtg tcgacgacgctg tcgacgacgc gctgccaa tggacggtga cgctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgccg aggagctgca aggagctgca ggatgaccga aggtcaacgga aggtcaacga aggtcaacga acgtcacaccga acgacaccga accctctcat ttgctggtga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cgcgcggcc cctcccgttc ggtcgaccc ggcgtcatg gaacccgaac catctactcg catggcgatc ggacgcattc ggacctggcc ctgcgccct cggccctct cggcccttc ggacctggc cgcccct aggttacta tactggagac tactggagat tactgaccct agttccgtt	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcagc ctccgcaact accaccaccg ggcgccaagg gagagaggga ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgcccaagg gtgcgcca tcgatccgcc atggccaaga gtgctagcca ggccgcaacc atgatccgg gaccgtcg ggccgcaacc aatgatccgg gaccgtagcca atggttatg gaaatcaagg gaaatcaagg gcgtttgttg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500 1560
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgt gctgctcgcg gcagcctcgt tgctgctcgc gcagcttcgc gcagcctcgt tcgtggtgcatgcc tcgtgggaa tggtcatgtc tcccaacgc tccggaggaa tggccacaaa acgacacaaa tcgatgctgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctacag gacctggtg gacctcggt gacctcaag gaggcgcg cttcgccaag cgagctcaag gatctgcat cgagctcaag gatctgcat cgagctcaag gatctgcat cgagctcaag gatctgcat cgagattc acaccatt acgcgagat acgtacgaga aggttcagag aggttcagag	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gaccaccg gcccagcagg tgcgtgctgc gccgggcacg agcgcgcgcacg agcgcgcgcac agcgcgcacg atcgtcgacc cgcggcacc atcgtcgac ttattgtcg gaacttgaag cacatggaaa atcagcgaaa	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc tcgacggctg tcgacgggct tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgccg aggagctgca ggatgaccga aggtcacggt aggtcacgga aggtcacga acgtcacgg agatcatgaa acctcatctcat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cctcccgttc ggtcgaccc ggcgctatg gaacccgaac catctactcg catggcgatc ggacgcattc ggacgcattc ggacctggc cgccctct aggtcact aggtacct aggtacct aggtacct agttcggtt gcagttcgtt	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgcaagg gagaggga gcgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgcccca tcgatcggc atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc aatgatccgg attggttatg gaaatcaagg gcgtttgttg gcaaaagagg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1380 1440 1500
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tcctcgggga tgcgctcgt gctgctcgcg gcagcctcgt tgctgctcgc gcagcttcgc gcagcctcgt tcgtggtgcatgcc tcgtgggaa tggtcatgtc tcccaacgc tccggaggaa tggccacaaa acgacacaaa tcgatgctgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctacag gacctggtg gacctcggt gacctcaag gaggcgcg cttcgccaag cgagctcaag gatctgcat cgagctcaag gatctgcat cgagctcaag gatctgcat cgagctcaag gatctgcat cgagattc acaccatt acgcgagat acgtacgaga aggttcagag aggttcagag	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gaccaccg gcccagcagg tgcgtgctgc gccgggcacg agcgcgcgcacg agcgcgcgcac agcgcgcacg atcgtcgacc cgcggcacc atcgtcgac ttattgtcg gaacttgaag cacatggaaa atcagcgaaa	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc aggtgcgcgc tcgacggctg tcgacgggct tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgccg aggagctgca ggatgaccga aggtcacggt aggtcacgga aggtcacga acgtcacgg agatcatgaa acctcatctcat	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cctcccgttc ggtcgaccc ggcgctatg gaacccgaac catctactcg catggcgatc ggacgcattc ggacgcattc ggacctggc cgccctct aggtcact aggtacct aggtacct aggtacct agttcggtt gcagttcgtt	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgcaagg gagaggga gcgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgcccca tcgatcggc atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc aatgatccgg attggttatg gaaatcaagg gcgtttgttg gcaaaagagg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1200 1260 1320 1380 1440 1500 160 160 160 160 160 160 160 1
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcggggc gcagcctcgt gctgctcgc gcagcctcgt tcgtggtgcg tcgtgctggc gcagcctcgt tcgtggtgcatgct tcgtgggac tcgtgcatgcatgcatgcatgcatgcatgct tccccaacgc tgcggggga aggccacaaa tcgatgatga tgctgctgt	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgct cgtgctgct cgtgctgct cgtgctgct cgtgctgct gacctggtg gacctggtg gacctcaag ggggcgcg cttcgcaag cgagctcaag gatctcaac cgacacacat cgacgagat caccacat acacacat acacacat agattcaag aggttcaag aggttcaag aggttcaag aggttcaag cgagttcaag cgagatc	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gccgtcgaga gaggccgtcg gaccaccg gcccagcagg tgcgtgctgc gccggggacca acgggatatg gagccgttcg acgggatatg gagccgttcg atcgtcgacc cgcgggaaa cagggatatg gagccttcg atcgtcgacc gacaaggaca ttattgtcg gaacttgaag catcagcgaaa tgcaaagtgt	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc gctgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggt tgaccgcegc aggagctgca ggatgaccga aggtcacggt tgaccgcaa tgaccgaca ccgacaccgg agatcacga acgtcacgga agtcaagtc ccgacaccgg agatcatgaa acttcgcga acgactgaa ttggctgaa acttctcat ttgctggtga acgagatcaa tctccgga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cctcccgttc ggtcgaccc ggcgctatg gaacccgaac catctactcg catggcgatc ggacgcattc ggacgcattc ggacctggc catctactcg catgcgcaac ggaccttc ggccctcct aggcccttc aggttacta tactggagac ggagataatt tactggagat tacgcacct agttccgtt tccattcca	ccggaggcgc cacctgacgc ctcatcgacg cyctgcgcaact accaccaccg ggcgcaagg gagaggga gcgcgactc gacgacgtgg ctcacccacc ctgcacttca ctcaactcgg ttcgaccacg gtgccca tcgatcggc atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc aatgatccgg attggttatg gaaatcaagg gaaatcaagg gcgtttgttg gcaaaagagg aagagtccat	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1500 1620 1680
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tgcgctcgt gctgctcgt gctgctcgt tcgtggtgga tggtcatgtc tcgtgggat tggtgatgtc tcgcgaacgc tcgtgctggt tcgtgctggt tcgtgctggt tcgtgctggt tcgtgctgct tcgtgctcgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgcttcgc tgccggaacgc tgccgggga aggccacaaa tcgatgatga ttgttttcta ctggcaagat	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc ggacctggtg gacctggtg gacctggtg gacctggtg gatcgcaag ggggcggcg tgtgctcggg cttcgcaag cgagctcaag gatctgcatc gaacaccatt cgacgagatc acctccagca cgtatcgag aggttcaag gatctcagca cctccagca cctccagca	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgctcg gagcgctcg gcccacgcagg tgcgtgctgc gccgggcacg agcgcgcgcacg agcgcgttcg agcgcgttcg gagcgttcg gagcgttcg gccggggatatg gagcgttcg atcgtcgac tcgcggcaagc atcgtcgac gacaaggatatt gagccgtttcg atcgtcgac gacaaggcaagc gacaaggcaagc gacaaggcaagc gacaaggcaagc gacaaggcgaagc gacaaggcgaaa tgcaaagtgt gacctgagag	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc tcgacgaggc gctgtcca cgatcgtgat gcgtgtcca ggatgacgcg aggacgtgat cgctgtcca cgatcgtgat gcgtcacggt tgaccgcga aggactgca aggatcacga aggtcaagtc ccgacaccga agtcaccga accttctcat ttgctggtga tcgcgga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cctcccgttc ggcgccgc catcgcgcc cctcccgttc ggcgctcatg gaacccgaac catctactcg catggcattc ggacgcattc ggacctgcc ctcccgttc catgcgcaac catctactcg catgcgcatc ggacctgccc tggcccctc agctccttc agctccttc agctcctta tactggagac catggcacct tgcctcctc agctccttc cgcctcctc agctccttc cgcatccta tactgagac catggagat tacgcacct agttccggt tccattcca	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagaggga gccgacttca ctcaactcac ctgactcac ttcgaccacg gtgccca tcgaccacg gtgccgacca atggccaaga gtgctagcca atggccaacc atgatccgg ggccgcaacc atgatcagg ggcgctagcca cggccgatcg ggccgcaacc attggttattg aaattaagg gagtttgttg gcaaaagagg aagagtcat ccggcagtg	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1560 1620 1680 1740
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcgggga tgcgctcgt gctgctcgt gctgctcgt tcgtggtgga tggtcatgtc tcgtgggat tggtgatgtc tcgcgaacgc tcgtgctggt tcgtgctggt tcgtgctggt tcgtgctggt tcgtgctgct tcgtgctcgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgctgt tcgtgcttcgc tgccggaacgc tgccgggga aggccacaaa tcgatgatga ttgttttcta ctggcaagat	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgcc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc ggacctggtg gacctggtg gacctggtg gacctggtg gatcgcaag ggggcggcg tgtgctcggg cttcgcaag cgagctcaag gatctgcatc gaacaccatt cgacgagatc acctccagca cgtatcgag aggttcaag gatctcagca cctccagca cctccagca	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgctcg gagcgctcg gcccacgcagg tgcgtgctgc gccgggcacg agcgcgcgcacg agcgcgttcg agcgcgttcg gagcgttcg gagcgttcg gccggggatatg gagcgttcg atcgtcgac tcgcggcaagc atcgtcgac gacaaggatatt gagccgtttcg atcgtcgac gacaaggcaagc gacaaggcaagc gacaaggcaagc gacaaggcaagc gacaaggcgaagc gacaaggcgaaa tgcaaagtgt gacctgagag	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc tcgacgaggc gctgtcca cgatcgtgat gcgtgtcca ggatgacgcg aggacgtgat cgctgtcca cgatcgtgat gcgtcacggt tgaccgcga aggactgca aggatcacga aggtcaagtc ccgacaccga agtcaccga accttctcat ttgctggtga tcgcgga	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cggcgcgcc cctcccgttc ggcgccgc catcgcgcc cctcccgttc ggcgctcatg gaacccgaac catctactcg catggcattc ggacgcattc ggacctgcc ctcccgttc catgcgcaac catctactcg catgcgcatc ggacctgccc tggcccctc agctccttc agctccttc agctcctta tactggagac catggcacct tgcctcttc cgcctcctc agctccttc cgcatcctt cagttaccta tactgagacc tactgcacct agttccggtt tccattcca cgcagcatt	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagaggga gccgacttca ctcaactcac ctgactcac ttcgaccacg gtgccca tcgaccacg gtgccgacca atggccaaga gtgctagcca atggccaacc atgatccgg ggccgcaacc atgatcagg ggcgctagcca cggccgatcg ggccgcaacc attggttattg aaattaagg gagtttgttg gcaaaagagg aagagtcat ccggcagtg	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1500 1620 1680
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaacccgtt tgatcgtcac tccccgtcgt tcctcggga tgcgctcgt gctcgtcgt gctcgtcgt tcgtggttcgc gcagcctcgt tcgtggttcgc gcagcctcgt tcgtggtgcc gcagcctcgt tcgtggtga tggtcatgtc tcgtgggaacgc tcggaacgc tccggaacgc tccggaacgc tccggaacgc tccggaacgc tccggaacgc tgccgggga aggccacaaa tcgatgatga ttgcggactga ttgcgaacta ttgttttcta ctgcaagat ataccacaca	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc cgtgctgctgc cgtgctgctgc cgtgctgctg cgtgctgctg cgtgctgc ggacctggtg gacctggtg gacctggtg gacctaag ggggcgcg tgtgctcaag cgagctcaag gatctgcatc cgacacatc cgacagagtc cgacacatc cgacagagtc cctcaggag cagagtcaag gatctcaag gatctcaag cgtatcgag cgtatcgag cgtatcgag cgtatcgag cgtatcaag gacacatc cgacaagagat cctcaggaag gtccaaaaac	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgttcg ggcaccaccg gcccatgcggt tcgcgggtcgc gccggggtcgc gccggggtcgc acggggtcgc acggggttcg gagcgttcg gaccaccg ttgcgtgcgc cgcggggatatg gagcgttcg atcgtcgac catgggca cagggatatg gaccatggca catggcaac catggcaac atcgtcgac gacaaggacg ttattgtcg gaacatggac taattgtcg gaacgaac atcagcgaaa tgcaaagtgt gacctgagag taagtcagat	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggcgc tcgacgaggc tcgacgaggc gcatgccaa tggacggtga cgctgttcca cgatcgtgat gcgtcacggt tgaccgccga aggtgacgca aggtgacgca aggtcacgg agatcacga aggtcaagtc ccgacaccgg agatcatgaa gttgctca acagactgaa ccttctcat ttgctggtga caaagctcgc adagctcgca acgactgaa ccttctcat ttgctggtga caaagctcgc atatgtttc	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc cctcccgttc ggtcgaccc cgcgcgcgcc catcgcgcc cctcccgttc ggacccc ggacccc catctactcg catgcgcatc gacctgacc catctactcg catgcgcatc ggaccctgcc ctccctc agcccctcctc agctccttc agctccttc agctccttc agctccttc agctcctt tactcggat tactgagac catctactact cagcacct actcact actgcgcacc tgcctcctc cgcctcctc cgcctcctc agcttacct actgagac cacct actcacct actcacct accacct ccaacct ccaacct ccacct cca	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagggga gccgacttca ctcaactcag ttcgaccacg gtgcgcca tcgactca ctcaactcgg ttcgaccacg gtgcgcca atggccaaga gtgctagcca atggccaaca atgatccgg atggctagca ggcaccgtcg ggccgcaacc aatgatcagg aattagta gaaatcaagg gaattagtg gcaaagaggcacttgttg gcaaaagagg aagagtccat ccggcagtg acacctctgt	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740 1800
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaaccccgtt tgatcgtcac tcctcggtga tgcgcctcgt gctcgttccga tgctgctcgt gctcgttggt gctcgttggt tcgtggtgcg tcgtgcgcttggt tcgtggtga tggtcatgtc tcgtggtga tggtcatgtc tcccaacgc tgcgggaacgaa tcgatgatga gattccaagt atgctgctgt tcgtggtga cccacaaa ccaacacacacat	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cggtttacgc ggacctggtg ggacctggtg cggtttacgc ggacctagtg cggttcagag ggacctagtg cacacagcgtc cgagctcaag ggagctcaag gatctgcatc gaacaccatt cgacgagatc acctccagca cgtatcagca aggttcaag gatctcagca cgtatcagca cgtatcagca cgtatcagca cgtatcagaa cagagatc acgtatcagaa cagagatc cctcaggaac gtaatgttct	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgttcg ggcaccaccg gcgcgcacg tgcgtgcg cccatgggca cagggttcg gccgcgcacg agcgcgcgcacg agcgcgttcg cgcgcgcacg atcgtcgac cagggatatg gagccgttcg atcgtcgac catggca ttattgcg gaaagacg ttattgcag catagacaat caagacgaaa tgacaagtgt taattaaaac taactagagat taattaaaac	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc tcgacgaggc gcetgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggc aggagctgca aggatgaccga aggtgaccga aggtcacga aggtcacga aggtcacga acgtcaccga acgtcaccga acgtcatgaa ctccattagaa ctctcat ttgctggtga acgagatcaa ccttctcat ttgctggtga caaagctcgc atatgtttc ggaaattatt	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc cctcccgttc ggcgcccc cctcccgttc ggcgctcatg gaccccaac catctactcg catgcgcatc ggaccctactcg gacccgaag ggcgcattc ggacctggccc tggcgccct tggctcctcc agctccttc aggttacta tactggaaa ggagaaac catctactact cactgcgcat cactgcgcat cactgcgcat cactcat ccacttact agctccttc aggttaccta tactggagac tactgagac cacttact agttccgtt ccattcca acatatagaa	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgcaagg gagagggga gccgcaact ctcaactcgg ttcgaccacc ctgaactca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc aatgatccgg attggttatg aaataaagg gagtttgttg gcaaaagagg ccggcagtt gaaaagagt cactctgt ggcgcattc gcactctt gcactctt acacctctgt gcacactctt acacctctgt ggctgattc	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740 1800 1860
aggaggtggt aagatttca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaaccccgtt tgatcgtcac tcctcggtga tgcgcctcgt gctcgttccga tgctgctcgt gctcgttggt gctcgttggt tcgtggtgcg tcgtgcgcttggt tcgtggtga tggtcatgtc tcgtggtga tggtcatgtc tcccaacgc tgcgggaacgaa tcgatgatga gattccaagt atgctgctgt tcgtggtga cccacaaa ccaacacacacat	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cggtttacgc ggacctggtg ggacctggtg cggtttacgc ggacctagtg cggttcagag ggacctagtg cacacagcgtc cgagctcaag ggagctcaag gatctgcatc gaacaccatt cgacgagatc acctccagca cgtatcagca aggttcaag gatctcagca cgtatcagca cgtatcagca cgtatcagca cgtatcagaa cagagatc acgtatcagaa cagagatc cctcaggaac gtaatgttct	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgttcg ggcaccaccg gcgcgcacg tgcgtgcg cccatgggca cagggttcg gccgcgcacg agcgcgcgcacg agcgcgttcg cgcgcgcacg atcgtcgac cagggatatg gagccgttcg atcgtcgac catggca ttattgcg gaaagacg ttattgcag catagacaat caagacgaaa tgacaagtgt taattaaaac taactagagat taattaaaac	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc tcgacgaggc gcetgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggc aggagctgca aggatgaccga aggtgaccga aggtcacga aggtcacga aggtcacga acgtcaccga acgtcaccga acgtcatgaa ctccattagaa ctctcat ttgctggtga acgagatcaa ccttctcat ttgctggtga caaagctcgc atatgtttc ggaaattatt	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc cctcccgttc ggcgcccc cctcccgttc ggcgctcatg gaccccaac catctactcg catgcgcatc ggaccctactcg gacccgaag ggcgcattc ggacctggccc tggcgccct tggctcctcc agctccttc aggttacta tactggaaa ggagaaac catctactact cactgcgcat cactgcgcat cactgcgcat cactcat ccacttact agctccttc aggttaccta tactggagac tactgagac cacttact agttccgtt ccattcca acatatagaa	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgcaagg gagagggga gccgcaact ctcaactcgg ttcgaccacc ctgaactca ctcaactcgg ttcgaccacg gtgccgcca tcgatccggc atggccaaga gtgctagcca atggccaaga gtgctagcca ggcaccgtcg ggccgcaacc aatgatccgg attggttatg aaataaagg gagtttgttg gcaaaagagg ccggcagtt gaaaagagt cactctgt ggcgcattc gcactctt gcactctt acacctctgt gcacactctt acacctctgt ggctgattc	120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740 1800
aggaggtggt aagatttcca ccgcggagct tgcaagacta gcgccacggg ccgggctgcg gccccgagtt ccaaccccgtt tgatcgtcac tcctcgggga tgcgcccggagt tcctcgggga tgcgcctcgt gctcgtccga tgctcgtcgt gctcgtcgt tcgtggtgcg tcgtgctcgt tcgtggtgga tggtcatgtc tcgtggtgga tggtcatgtc tcccaacgc tgcggaggga aggccacaaa tcgatgatga gattccaagt atgctgctgt tgcgggga ccacaaa ccaacacacacacacacacacaca	tccggcgaga ggtgttccgg ctgcttcgag cgcctcggc cgccttcgtg ctacacgccc cgaggcctgc ctccgtcgac agaaagcggc gtactcgtc caccagcgtc cggtttacgc ggacctggtg ggacctggtg cggtttacgc ggacctagtg cggttcagag ggacctagtg cacacagcgtc cgagctcaag ggagctcaag gatctgcatc gaacaccatt cgacgagatc acctccagca cgtatcagca aggttcaag gatctcagca cgtatcagca cgtatcagca cgtatcagca cgtatcagaa cagagatc acgtatcagaa cagagatc cctcaggaac gtaatgttct	tccatggct tcgaagctcc cgcctgccgg acctacggcg gtccgcaagg ttcctcggcg cacgagatcc gcgtcgtcg gagcgttcg ggcaccaccg gcgcgcacg tgcgtgcg cccatgggca cagggttcg gccgcgcacg agcgcgcgcacg agcgcgttcg cgcgcgcacg atcgtcgac cagggatatg gagccgttcg atcgtcgac catggca ttattgcg gaaagacg ttattgcag catagacaat caagacgaaa tgacaagtgt taattaaaac taactagagat taattaaaac	ccatcgcggc cggacatcga agctctccgc aggtggacgc gcgacgtggt cggcccggct accgccaggc acgacggctg tcgacgaggc tcgacgaggc gcetgccaa tggacggtga cgctgtcca cgatcgtgat gcgtcacggc aggagctgca aggatgaccga aggtgaccga aggtcacga aggtcacga aggtcacga acgtcaccga acgtcaccga acgtcatgaa ctccattagaa ctctcat ttgctggtga acgagatcaa ccttctcat ttgctggtga caaagctcgc atatgtttc ggaaattatt	agacttggcg gatcccgacc ccgcgcctgc cctctcgcgc catggcgctc cgcgcgcgcc cctcccgttc ggcgcccc cctcccgttc ggcgctcatg gaccccaac catctactcg catgcgcatc ggaccctactcg gacccgaag ggcgcattc ggacctggccc tggcgccct tggctcctcc agctccttc aggttacta tactggaaa ggagaaac catctactact cactgcgcat cactgcgcat cactgcgcat cactcat ccacttact agctccttc aggttaccta tactggagac tactgagac cacttact agttccgtt ccattcca acatatagaa	ccggaggcgc cacctgacgc ctcatcgacg cgctgcgcaact accaccaccg ggcgccaagg gagagggga gccgacttca ctcaactcag ttcgaccacg gtgcgcca tcgactca ctcaactcgg ttcgaccacg gtgcgcca atggccaaga gtgctagcca atggccaaca atgatccgg atggctagca ggcaccgtcg ggccgcaacc aatgatcagg aattagta gaaatcaagg gaattagtg gcaaaagagg aagagtcat ccggcagtg acacctctgt	120 180 240 300 360 420 480 540 600 720 780 840 900 960 1020 1080 1140 1260 1320 1380 1440 1560 1620 1680 1740 1800 1860

<pre><210> 143 <211> 2016 </pre> <pre><212> DNA <213> Lolium perenne</pre> <pre><400> 143 gagagagga atcaagcaag ccatctccca cgactaattt atcattatte tctgettctc getegatege gagagateg ggtgetcagt tagtatateg tagtatateg ttegtgeteg gagagatega tggtgetegt tagtatateg tagtatateg teeggtegaa getegatega tagtategateg tagtategateg teeggagaggateg teeggatega teeggategategategategategategategategate</pre>
category trees and the second of the second
category trees and the second of the second
tecquitagg ttecquitage agracagy gytagetage tagetateteg tactatagatea traceatagg ttecquitage agracagy agracagy gytagetage gycagagagy gytagetage tecgagagag agracagy gacagy gacagy gacagy general gytagetage acasegagagagagagagagagagagagagagagagagagag
tcogqtagaa ggctcocqaa atcgaqatca acaaqaga agcatcqaa agctactqat gcqaaqata ggcqaqaq cottoagaaqat ggcqaaqata gacaccqaa catgaqatca catgaqatca catgaqatca catgaqatca catgaqatca catgaqatca catgaqatqa acctgatca cagaqatqaaqa cattcatcat aggcqaaqaq gqaqtqaqa acctgatca caccqaaqaqaqaqa qqaqtqaqa caccqaaqaqaqaqa qqaqaqaqa qqaqaqaqa
cctaeaacta acggagagta gatecatgaa cegtogeac cedgagaggag ctycgecgaa 360 tgggegtggg gaagggcaa gtggtgataa acctyctocg caactgcaca 282 tctcttetet gagetggga aggetggaa aggetgaga acctyctocg caactgcaca cegttacacacacacacacacacacacacacacacacacaca
cctacaccta cacqqagtc gactcactga cccqtcqcc cqqqqqqqqqqqqqqqqqqqqqqqqqqq
tetecttect gggegegee aggetgggeg eggegaag eggeggege caacecac cacegeaaa Cegttetaca 480 cacegaaga gatecacege caggagagag eggeggggggggggggggggg
cctgcacqa gatccacqc cagacqaqqqq cycqqqqqq caaqtcqatc qtcacqqqq 540 tcqacqqqqq gqcqacqqq tcqqqqqq tcqqqqqq tcqqqqqq tcqqqqqq acctacqcqq qaqqqqqqq accacqacqqq qaccacqaqqqqqqq accacqacqqq qaccacqaqqqqqqq accaqqqqqqqq
cctgcgcgt gagaaggtg ctggatgact cggagggcg gggcctyccc gtggtcaccg 600 ccgagggag gocgacggg tgcgtgact tcaccgagact gatcaccac 660 ccgaggcgag caggccggg tacctccca acgacgtcg cgcctcccc tactcctcg gcaccaccgg gtccccaag ggcgtcatgc tcaccaccg cagcctcgtc tactcctcg gcaccaccgg gtccccaag ggcgtcatgc tcaccaccg cagcctcgtc accacgctgt tgacggtca gacccaaccg tgtgcttcac accacacg tgtgcttcac accacacg ggctgccgg 900 ccggcgcacc catcgtcatc atgcgcaagt tgacgtcgg ggcgctggtg gacctcgtc gcgcgcaccg catcgtcatc atgcgcaagt tgacgtcgg ggcgctggtg gacctcgtc gcggcacacg catcaccatc gcgccattcg tgccgccat cgtcgtggag atcgccaagg gcgaccacgg cggcgcgac gacctcaca ggcccttca tggccaaga gtcgtctggag atcgccaaga gcaggtacgg gatgactcaag gacctcaca ggcccttca tggccaaaga cccaacgcc gtgtcggac aggcttaca ggtcaagtcc gggtcggg gacctggcg gacctggca gagctctacaag aggctactgag gatgactgag gcgggcgg tgttggcaa ggcaccaagg 1200 agcccttcaa ggtcaagtc gggtcgcgg gaccgggggggggg
ccgaggagg ggcgcaggg tcctccaaag tcctccccg acgactcgcc tattcctcccg gcaccaccgg gctccccaaag ggcgtcatgc tcacccaccg cagcctgcc tattcctccg gcaccaccgg gctccccaaag ggcgtcatgc tcacccaccg cagcctcgcc tattcctcccg gcaccaccgg gctccccaaag ggcgtcatgc tcacccaccg cagcctcgtc accagcgtcg gcctgctgcc gctgttccac acctactcgcg tgtgctgcac gaggctcgcg tcggcgcaccg catcaccatc gcgccattcg tgcaccacgt gctgctgggg ggctccgcg gcgaccaccg catcaccatc gcgccattcg tgcaccacgt ggtggtggag acctcgaca gcgacaccgc catcaccatc gcgccattcg tgcaccacgt ggtggtggag acctcgaca gcgacaccgc catcaccatc gcgccattcg tgcaccacgt ggtgggag acctcgaca gcgacaccgc catcaccatc gcgccattcg tgccaccat ggtgtggag acctcgaca gcgacaccgc gacctccaa gacctccaa gaccccacacgcc ggtgtgggaa dacgccaaga 1020 accatgggcaa gacctcaag gaccctcaa tggccaagat cccaaacgcc gtgttgcgac 1140 acggtacacg gatacatgaa ggttacctga ggcaggacca gaccacacgg gcatccctcg gcacacgag gaccacacga gccggcaaga accacacacg ggttacccaag accacacaga gccggagaaca gacacacac
gcaccaccgg gctccccaag ggcgtcatgc teaccaccg cagcctcgtc accagctggt gaccaccacgg ggcgtcytheaa accaacacgg tytgcttcaa caaggacgac ggcgtcythy gaccggcgcaccacgg actcaccac ggcgcattcg tycaccacggt cytgcgcacacgg catcaccac ggcgcattcg tycaccacgg catcaccac ggcgcattcg tycaccacgg catcaccac ggcgcattcg tycaccacgg ggcgcacacgg catcaccac ggcgcattcg tycaccacgg ggcgcacacgg gacctccac ggcgcattcg tycaccacacgg ggcgcggg gacctcgacg gacctccac ggcgcacacgg gacctccac ggcgcacacgacggcacacggc gacctccacacgacgacacggcacacggcacacggacacacgacg
cccagetgyt tyacggytcg aacccaaacg tytgetteaa caaggacgae gegetgetgt gegetgetgee getytteece atcaceacg tyacacggg gegetgetgg gygetceggg 900 teggegeacg catedacact gegecatteg tyacacggg getygtggg gygetceggg 900 teggegeacg catedacact gegecatteg tyacacaggg getygtggg gactegtgg gygetcegge gacacgggacggg acctogaat cateacact gegecatteg tyacacaggg gygetyggg acceaggggaacgggaacgggaacgggaacgggaacggaacgggaacggaacgggaacggaaggaaggaaggaaggaaggaaggaaggaagaa
gectgetgec getgttecac atcaccace tgacaagg getgetggg gggetceggg 900 teggegecge categteat atgegeaagt tegacggg gegetggtg gacetegge 900 gegegeacege categeate atgegeaagt tegacggg gegetgggg gacetegge 900 gegegeacege cateaceate gegecatteg tgegegeat egteggga ategecaaga 1020 gegacegeg teggegeag gacetegeat ecategeat gytgetetee ggegeegeg 1080 ecatgggeaa ggaceteag acgegettet tgegeaagat eccacaagee gytgetggaa ategeaaga 1200 agecettea gytacagge gytgetggeat gytgeegeag gytgetggee ttegeaagg 1200 agecetteaa gytacaagtee gyggtetgge geacegtggt gegeaaegae gageteaagg 1260 tegetgaee eggagaagea getaceteg geaggaacea geeggegga atetggtee 1320 gegggaagea gateatgata gytacetga acgaceaga gytetaceaag accaggagaa acacagag 1380 acaaggaegg etggeteaa accaggagata teggettggt ggacgacgae gacgagatet teatgetga caggeteaa acgagataa teggettggt ggacgacgae gacagatet teatgtega caggeteaa acgagataatea agtacaaggg ettecaaggg gegeggggg 1500 aggeteggage ectectecte acgaaaccagg agteaaggae gegegegegg 1500 aggatgate etteacegae getsgetge etteattaa gagategaa ggatetgaga gatetgagaa gacatgatea tecaagaggatet etteacegae tecaattecea agaaccette eggaaaggate atteatgata acateggaa acgagatea tecaategae gytgettte aggagatea acateggaagg 1680 gegegette eaggaacgae acategeaga agaagatea acateggaaggat eatattette ttgeaggaga tateagttg 1920 tatttttga ecatgtaaaa aaaaaa 2006 <210> 144 <211> 1789 <212> DNA <213> Lolium perenne <400> 144 ctaaacacte geaaatecea cageaacaga agcacctaa caccggaaga gyttgytgta agagageeta tecaggaggeet tecegetee geaagaggeet ecaggageet ecaggageet ecaggageet ecaggage gyttgytggg gytteetg ecateggag gyttgytggg gytteetg ecateggag gyttgytggg ecateggaga acaacacaca ecateggag ateaggaga acaacacaca ecateggag acaacacaca ecateggag acaacacacacacacacacacacacacacacacac
geggacacgg catcaccate gegceatteg tgeggecat cgtgtggag ategecaaga 1020 gegacacgcgt cggegecaga gacctecaat gacctecaat ggtgetetee geggegecggc 1080 catgggaaa gaactecaag gacctecaat tggecaagat ceccaaagec gtgetegga 1140 agggttacgg gatgactgag gacgecttea tggecaagat ceccaaagec gtgeteggaa gacgatetaatagggaccetteaa ggtcaagtee gggtgtgge gacggtggtg gacgagacga gtgetegaag 1200 tegtegacee egacacegge gatectegg gacgggaacca gtgetegaag gaccetteaa ggtacatgaa gacaccateg ggtaccetea acaggaaga gatcatgata acaaggacgg ctgetgea accggagata teggettgg gacgaagaag acaaggatgate tetectee aggaaccega aggtacaagg aggtacaagg aggtacaagg acaaggatacte tetecggaga gacaccagg aggtacaagg acaaggatacte tetecggaga gacaccagg aggtacaagg cetecteate acaggaaccega aggtacaagg acaaggateate cttcacgac acattegete caaaggaggt tyttiteaa aagaggatea 1680 tecaaggag aggaagaacca aggaagaacca acaatgggaa aagaactac caaatgggaa aaaaaaa 2006 <2210 144 <2211 1789 <212 DNA <213 Lolium perenne <400 144 ctcaacaacte gcaatecca aagaggetta teegeetee caaggagget teegeetee caaggagggga gategaagggggggggggggggggggggg
gcgaccgcgt cggcgcgac gacctcgat catecgcat ggtgctctcc ggcgcgcgc 1080 ccatagggaa ggacctcaa ggacctcat tggccaagat ccccaacgcc gtgctcgacg 1140 agggttacgg gatgatgag gccggcgcgt tgctgcgac tgcgcaacgacga ggtcaagga gatgatgag gcggtcgtgg ggaaccatcaa ggtcaagga ggtcatagg ggtcatcatga acgaccatga ggtcaagga atcetctg gcggaagaca gatcatgata ggttacctga acgaccaga gaccacaga acaaggacga ctactgataa ggttacctga acgaccaga gtctaccaga gaccacaga acaaggacga ctactgataa ggttacctga acgaccaga ggtcaaagga ctacatgata aggatcatca agtacaagga gtctaccaga gactacacaga ggttacatga acgaccaga ggttacacaga gactacacaga gactacacaga ggttacacaga gactacacaga ggttacacaga caccacaga gtctaccagag cttccatgtca acgaaccaga gagtcaaaggacgac cttccatgacaga cactcctcacacagaaccaga ggttacaagga cttccacgagaa gagtcaaag gagtcaaagga cactcacagaagatca cttcaacgaca cattcgctc cacagagagt tcttcacagaag gagtcaaaggatca cttcacagaaga caattcgct caaaggaggt ggttttctac aagaggagtca acttgagaga caggccgctct caggaacgaa acaaccatg ggtggtata ggtgttttaa aagaggagta 1680 acaaatgggga aagaacaaca gggaggggat catattatac ttgcaggaga tatacagtag ggaggaggagaa acaacacaca gggaggggag
ccatagggaa gacctccag gacgacttca tggcaagat cccaacggc gtgctggac 1140 agggttacgg gatgactgag gccgggcgg tgctggcat gtgtggcat gtggccatg gtgccatagg gtgcctgagg gtgccattca gtgacctaag gtgccaagtc gggtcatgtgc gcaccgtggt gcgcacgtggt gcgcacagga gtccaagg 1200 agccctcaa gtgcaagcc gggtcaccgg gcaccagga gacctaagg ggttacctaa acaccacca gcgggaagca gaccacaga gactatgata ggttacctaa acacaccacag gttaccaag acacacaccac gcgggaagca cacggctgaga caccacacaga gaccacaaggagca acacacac
agggttacgg gatgactgag gccgggccgg tgctgcact gtgcgccat gggcccttcaa ggtcaagtc ggctcgtgcg gcacctgtgt gcgcaacgca gagctcaagg 1260 tcgtcgacc cgcaaccgcg gcatcctcg gcaggaacca gccgggaagaca gatcatgata ggttacctga acagcccaga accaggagat tcggctgtgt gcccgggaagaca gaccatgat tcggctgtgt gagcacgaga accacacg 1320 gcgggaagaca gatcatgata ggttacctga acagaccaga gtctacaaga gaccacacg ggcagaatct tcatcgtcga caggctcaag gagatcatca agtacaagg cttccaagtg gcgcagagat tcggctgaga ctccctcctc acagaaccagg aggtcaagga ctccacgaga actagatca ctggcggaa gtcccggaga ggtcaagga ggtcaagga gagatcataa gagatcaaga gagtcaagga catcacgaga gtcccggaa caggatcatc ctgagggaa caattcgtc caaaggaggt gttttcaca gagagatca acaggacgac caggatcaag gagatcataa ggagatcaag caattcgtc caaaggaggt gttttcaac aaggaggtca acaggacgac caaggatcaag ggccgcgcttct caggagagaca caatacgatcg ggtcggcac caaggatcaag ggtcgggaagaccaaggaggaggaggagagaggagag
tcgtcgaccc cgacaccgge gatacctcg gcaggaacca gcccaggag atctgccc 1320 gcgggaagca gatcatgata ggttacctga acgacccaga gtctaccaga acacactcg 1380 acaaggacga cggctgacaca acggctcaag accgggagata tcggcttggt ggacgacgac gacgagatct 1440 tcatcgtcga caggctcaag accgaggata tcggcttggt ggacgacgac gacgagatct 1440 tcatcgtcga caggctcaag accgagata tcggcttggt ggacgacgac gacgagatct 1440 tcatcgtcga caggctcaag gagatcatca agtacaaggg cttccaggtg ggacgagagacgac gagatcatca agtacaagga cttccaggtg ggacgagagacgac gagatcatca agtacaagga cttccaggtg ggacgacgac gagatcatca agtacaagga cttccaggtg gcgccgcgcg gtagggggg 1500 aggatcatca agtacaagga cgccgcgctg gtaggggggg 1560 aggatcatca ctgaggaccca cattccca agaacccgg tgttttcaa aaggaggtca accaggatcgac catttccaa agaacccttc caggaagatc ctaaggaagg 1680 accattgagac accattgagac acaattcgtc cacacgaagt tgccggccg agaagactaag 1800 accaattgggga aagaacacac gggagggggat catattatc tgcaggaga tatcagttg 1920 atcatttttga ccatgtaaaa aaaaaa 2006 <210> 144 <211> 1789 <212> DNA <213> Lolium perenne <400> 144 ctcaacactc gcaactcca cagccacaga agccactac caccgctca cgcagccc ctccggcgc catcgcgcg cgaagcccta ctggggctct tcgcgcgcg ggtgttggg atcgcggag ggttccagg ggtgtccagacgac ctccaggacgc ccatcgtcg gaactggc caaggacgt tccgcaagacgc ccactggtcg gaagagcgac accggacgc ctccacaga agcacctac accgcaagacgc cccatcgtcg gaactggac caggacggc ctccacaga agcacctac accgcaagacgc ctccagacgac ctccggacgc ctccggacgc ctccacagacgacgc ctccacagacgacgc ctccacagacgacgcacacagacgcacacagacacagacgac
gcgggaagca gatcatgata ggttacctga acgacccaga gtctaccaag acaccatcg cacagagacta tcategtcga caggetcaag accggagata tcggcttggt ggacgacgac gacgagatct 1440 acacagaggc catcetcete acgaacccgg aggtcaagg cgccgcgcg gagatcaag caceggaga gtcecggtcg catcataa gagatcaag caceggtcg ccttcattaa gaggatcgaa ggatcgaag gacgagatcaag caatcgtct cacaggaga caggatcaag caatcgtct cacaggaggt tgttttcac aaggaggt cacaggagac caggetcge gctgacate cacaggaggt tgtttttac aaggaggt acatcaggagactaaggactacaggagactgacaggagactacaggagactgacaggagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactgagactacaggagactgagactgagactgagactgagagactgagactgagagactgagagactgagagactgagagactgagagactgagagactgagagaga
acaaggacgg ctggctgcac accggagata tcggcttggt ggacgacgac gacgagatct 1440 catacgtcga caggctcaag gagatcatca agtacaaggg cttccaggtg gcgcgcggg 1500 aggctgaggc cctcctcctc acgaacccgg aggtcaagga cttccaggtg gcgcgcggg 1560 aggatgatct ctgcggcgaa gtcccggtcg ccttcattaa gaggatcaa aggactcaag gacccgacgc gtaggggtga 1620 tcaccgagaa cgagatcaag caattcgtct caaaggaggt tgttttctac aagagaggt 1680 acttgagagc caggctcgcc gctgcacccacacacacctc cggcaagatc actaaggaagg 1740 acttgagagc caggatcgcc gctgcaccccacacacacctc cggcaagatc actaaggaagg 1740 acttgagagc caggatcgcc gctggcatcc cacacgaagt tgccggccg agaagctaag 1800 ggccgcttct caggaaccac atcaccatg gtgctgtta ggtgctgtta tagaccacac 1860 caaatgggga aagaaactac gggaggggat catattattc ttgcaggaga tatcagtttg 1920 ttgattcgcc ctgcttggt aaatgttgata aaatgaaatg
agetcgagge cetectecte acgaaccegg aggtcaagga cgccgccgtc gtaggggtga 1560 aggatgatet etgeggegaa gteceggteg etetectataa gaggategaa ggatctaaga 1620 teacegagaa caattecgte acaaaggaggt tgtttetae aaggaggtea 1680 acaaggaggt etetecae agaaccette eaggeaggegegetete etgeggege acaaeggggat etgegggegegegegegegegegegegegegegegege
aggatgatct ctgcggcgaa gtcccggtcg cattcattaa gaggatcgaa ggatctgaga 1620 tcaccgagaa cgagatcaag caattcgtct acacggagat cacaggagatca actgagagc caggctcgcc gctggcatcc actgagagggggggggg
tcaccgagaa cgagatcaag caattcgtct caaaggaggt tgtttctac aagaggatca acaaggtcta cttcaccgac tccattccca agaacccttc cggcaagatc ctaaggaagg gatgagggcectc caggaaccga atcacccatg gtgctgtta tgccgcgccg agaagctaag 1800 ggcgcttct caggaacgaa atcacccatg gtgctgtta ggtgctgtta tagaccacac 1860 caaatgggga aagaaactac gggaggggat catattattc ttgcaggaga tatcagtttg 1920 ttgattcgcc ctgcttgtt aatgttgata aaatgaaatg
acaaggtcta cttcaccgac tccattcca agaacccttc cggcaagatc ctaaggaagg 1740 gctgcgctctc caggaacgca atcacccatg gtgtgttta ggtgctgtta tagaccacac 1860 caaatgggga aagaactac gggaggggat catattattc ttgcaggagga tatcagtttg 1920 ttgattcgcc ctgcttgtgt atgtgtgata aaatgaaatg
ggccgcttct caggaacgca atcacccatg gtgctgtta ggtgctgtta tagaccacac 1860 caaatgggga aagaactac gggaggggat catattattc ttgcaggaga tatcagtttg 1920 ttgattcgc ctgcttgtgt aaaagaaa aaaaaa 2006 <210> 144 <211> 1789 <212> DNA <213> Lolium perenne <400> 144 ctcacacactc gccaatccca cagccacaga atgagggccta caggaggtcc tcctcctgga gaaggccta ctggggctct tcgcgggg ggtgctggc ccaatggagg ggtgggagggggggggg
ttgattcgcc ctgcttgtgt aatgttgata aaatgaaatg
ttgattcgcc ctgcttgtgt aatgttgata aaatgaaatg
<pre><210> 144 <211> 1789 <212> DNA <213> Lolium perenne <400> 144 ctcaacactc gccaatcca cagccacaga agccacctae caccgctca ccgatcgacg atggaggtcc tcctcctgga gaaggcccta ctggggctct tcgcggcggc ggtgctggcc 120 atcgcgatcg cgaagctcgc cggcaagcgc ttccgcctcc cgcccggccc ctccggcgcc 180 cccatcgtcg gcaactggct ccaggtcggc gtgttcctg ctccgcacgg ggtgtcggcg gtgtccagc ccggacagcg ctccaacgg gacaccgaa cctgatgggc 300 gtgtccagc cggagctgc caaggaggtg ctccacacga agggcgtga gttcggctc 360 cgcacccga acgtcgtct cgacatctc accggcacc agggcgtga gttcggctc 360 cgcacccga acgtcgtct cgacatctc accggcacac accaggaggtg gtcgacgc 360 cgcacccga acgtcgtct cgacatctc accggcaacg gccaggacat ggtttcacc 420 gtctacggcg accactggc caagatgcg cggatcatga ccgtccctt cttcaccaac 480 aaggtggtgg cgcagaaccg ggtgggctgg gaggaggag ccaggctcgt ggtggaggac 540 gtcaaggccg acccggcgtc cggaccgcc ggcaccgtga tccgccgtag gctgcacctc 600 atgatqtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgaccc 660</pre>
<pre><211> 1789 <212> DNA <213> Lolium perenne </pre> <pre><400> 144 ctcaacactc gccaatcca cagcacaga agcacctae caccgctca ccgatcgacg atggaggtcc tcctcctgga gaaggcccta ctggggctct tcgcggcgc ggtgctggcc atcgccgtcg cgaagctcgc cggcaagcgc ttccgcctcc cgcccggccc ctccggcgcc ccatcgtcg gcaactggct caggtcggc gacgacctga accaccgcaa cctgatgggc atcgcgaagc ggttcgggga ggtgttcctg ctccgcatgg gcatccgcaa cctgatgggc gtgtccagcc cggagctggc caaggaggtg ctcacacagc agggcgtgga gttcggtc cgcacccga acgtcgtct cgacatctc accggcaccg agggcgtgga gttcggctc gtctacgggg accactggc caagatgcg cggatcatga ccggccctt cttcaccaac gtctacggg accactggc caagatgcg cggatcatga ccgtccctt cttcaccaac gtctacggga accactggcg caagatgcg cggatcatga ccgtccctt cttcaccaac aaggtggtgg cgcagaaccg ggtgggctgg gaggaggagg ccaggctcgt ggtggaggac gtcaaggccg acccgcgct ccgcaccgcc ggcaccgtga tccgccgtag gctgcagctc atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgaccc cgtcgacgac</pre> 600
ctcaacactc gccaatcca cagccacaga agccacctae caccgctcca ccgatcgacg atggaggtcc tcctctgga gaaggcccta ctggggctct tcgcggcggc ggtgctggcc 120 atcgccgtcg cgaagctcgc cggcaagcgc ttccgcctcc cgcccggccc ctccggcgcc 180 cccatcgtcg gcaactggct ccaggtcggc gacgacctga accaccgcaa cctgatgggc 240 atcgcgaagc ggttcggga ggtgttcctg ctccgcatgg gcatccgcaa cctggtggtg 300 gtgtccagcc cggagctggc caaggaggtg ctccacacgc agggcgtgga gttcggctcc cgcacccgca acgtcgtct cgacatcttc accggcaacg gccaggacat ggtcttcacc 420 gtctacggcg accactggcg caagatgcgc cggatcatga ccgtccctt cttcaccaac 480 aaggtggtgg cgcagaaccg ggtggctgg ggtggaggag ccaggctcgt ggtggaggac 540 gtcaaggccg accaggctc cgcgaccgcc ggcaccgta tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgacgcc 660
ctcaacactc gccaatcca cagccacaga agccacctae caccgctcca ccgatcgacg atggaggtcc tcctctgga gaaggcccta ctggggctct tcgcggcggc ggtgctggcc 120 atcgccgtcg cgaagctcgc cggcaagcgc ttccgcctcc cgcccggccc ctccggcgcc 180 cccatcgtcg gcaactggct ccaggtcggc gacgacctga accaccgcaa cctgatgggc 240 atcgcgaagc ggttcggga ggtgttcctg ctccgcatgg gcatccgcaa cctggtggtg 300 gtgtccagcc cggagctggc caaggaggtg ctccacacgc agggcgtgga gttcggctcc cgcacccgca acgtcgtct cgacatcttc accggcaacg gccaggacat ggtcttcacc 420 gtctacggcg accactggcg caagatgcgc cggatcatga ccgtccctt cttcaccaac 480 aaggtggtgg cgcagaaccg ggtggctgg ggtggaggag ccaggctcgt ggtggaggac 540 gtcaaggccg accaggctc cgcgaccgcc ggcaccgta tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgacgcc 660
atggaggtc tcctctgga gaaggcccta ctggggctct tcgcggcgc ggtgctggcc 120 atcgccgtcg cgaagctcgc cggcaagcgc ttccgcctcc cgcccggccc ctccggcgcc 180 cccatcgtcg gcaactggct ccaggtcggc gacgacctga accaccgcaa cctgatgggc 240 atcgcgaagc ggttcggga ggtgttcctg ctccgcatgg gcatccgcaa cctgatggtg 300 gtgtccagcc cggagctggc caaggaggtg ctccacacgc agggcgtgga gttcggctcc 360 cgcacccgca acgtcgtctt cgacatctc accggcaacg gcaggacat ggtcttcacc 420 gtctacggcg accactggc caagatggc cggatcatga ccgtccctt cttcaccaac 480 aggtggtgg cgcagaaccg ggtggctgg gggaggagg ccaggctcgt ggtgaggac 540 gtcaaggccg accacggctc cgcgaccgc ggcaccgtga tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgacgc 660
ategeegteg egaagetege eggeaagege tteegeetee egeeeggeee eteeggegee 180 cccategteg geaactgget eeaggtegge gacgacetga aceaeegeaa eetgatggge 240 ategegaage ggttegggga ggtgtteetg eteegeatgg geateegeaa eetggtggtg 300 gtgteeagee eggagetgge eaaggaggtg eteeacaeege agggegtgga gtteggetee 360 egeaceegea acgtegtett egacatette aceggeaaeg geeaggacat ggtetteaee 420 gtetaeggeg aceaetggeg eaagatgege eggateatga eegteeett etteaeeaae 480 aaggtggtgg egeagaaeeg ggtggetgg gaggaggagg eeaggetegt ggtggaggae 540 gteaaggeeg aceeggegte egegaeegee ggeaeegtga teegeegtag getgeagete 600 atgatgtaea acgaeatgtt eegeateatg ttegaeegea ggttegagte egtegaegae 660
atcgcgaagc ggttcgggga ggtgttcctg ctccgcatgg gcatccgcaa cctggtggtg 300 gtgtccagcc cggagctggc caaggaggtg ctccacacgc agggcgtgga gttcggctcc 360 cgcacccgca acgtcgtctt cgacatcttc accggcaacg gccaggacat ggtcttcacc 420 gtctacggcg accactggcg caagatgcgc cggatcatga ccgtcccctt cttcaccaac 480 aaggtggtgg cgcagaaccg ggtgggctgg gaggaggagg ccaggctcgt ggtggaggac 540 gtcaaggccg acccgcgtc cgcgaccgcc ggcaccgtga tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgagtc cgtcgacgac 660
gtgtccagcc cggagctggc caaggaggtg ctccacacgc agggcgtgga gttcggctcc 360 cgcacccgca acgtcgtctt cgacatcttc accggcaacg gccaggacat ggtcttcacc 420 gtctacggcg accactggcg caagatgcgc cggatcatga ccgtccctt cttcaccaac 480 aaggtggtgg cgcagaaccg ggtgggctgg gaggaggagg ccaggctcgt ggtggaggac 540 gtcaaggccg acccggcgtc cgcgaccgcc ggcaccgtga tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgagtc cgtcgacgac 660
cgcaccegca aegtegtett egacatette aeeggeaaeg geeaggacat ggtetteaee 420 gtetaeggeg aeeaetggeg eaagatgege eggateatga eegteeett etteaeeaae 480 aaggtggtgg egeagaaeeg ggtgggetgg gaggaggagg eeaggetegt ggtggaggae 540 gteaaggeeg aeeeggegte egegaeegge ggeaeegtga teegeegtag getgeagete 600 atgatgtaea aegacatgtt eegeateatg ttegaeegea ggttegagte egtegaegae 660
aaggtggtgg cgcagaaccg ggtgggctgg gaggaggagg ccaggctcgt ggtggaggac 540 gtcaaggccg acccggcgtc cgcgaccgcc ggcaccgtga tccgccgtag gctgcagctc 600 atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgagtc cgtcgacgac 660
gtcaaggccg acceggcgte egegacegee ggcaeegtga teegeegtag getgeagete 600 atgatgtaea acgaeatgtt eegeateatg ttegaeegea ggttegagte egtegaegae 660
atgatgtaca acgacatgtt ccgcatcatg ttcgaccgca ggttcgagtc cgtcgacgac 660
TOO
Cogococcoa acaagorous ggrand googageges grand grand
gactacaact acggcgactt catecccatt etcegacegt tecteegeaa gtaceteaac 780 cggtgcacaa aceteaagac caagaggatg aagetetteg aggaceaett egtegetgae 840
aqaaaqaaqq cqctqqagca gaatggggag atcaqqtgcg ccatggacca catcctggag 900
gcggagagga agggcgagat caaccacgac aacgtcctct acatcgtcga gaacatcaac 960

gttgcagcca cacccggacg gcggtgacgg ctccgcctcc ctcgccggct aacgacccca gagaaggccg cggagctgcc	tccagtcgaa agccggacct gcatggccat acgacatccc agcggtgggt tcgaggccca ccgggatcgt	gctccgcgac ggagcgcctc cccgctgctc cgccgagtcc gcgcgccgac cggcaacgac cctcqcgctq	gagatgaccg ccctacctgc gtgccgcaca aagatcctcg gagttcaggc ttccgcttcg cccatcatcg	ccgtgctggg agtccgtcgt tgaatctcag tcaacgcatg ccgagcgctt tgcccttcgg gcatcacgct	cgccgacgtg gaaggagacc cgacgccaag gttcctcgcc cctcgaggag cgtcggccgc cggacgcctc	1020 1080 1140 1200 1260 1320 1380 1440
ttgtgctttt	tcagcaacca ttctatttga ggtgccggga attttactta	gatcctcaag tcgtatggag gatcgatcta	cacgccaccg gcttctgaca tgcacgcatg tgttggtctt	tcgtctgcaa tgcgtgtctg tgatgtgtat catgtgaggc	gccgctcgag tgcatgcatg tttccttttt	1500 1560 1620 1680 1740 1789
<210> 145 <211> 1358 <212> DNA <213> Loliu	m perenne					
aagagaatgg gccaccggcc	gcagcgtcga acctctcccc	cccacgcctc cgcctccgag gtacacgtac	aagacgatca aacctcagga	ccggctgggc ggacgggcgc	cgccagggac tgaagatgtg	60 120 180 240
cttggtgctt	caaaataccc	cggcatctgc catggttccc gtacagcgtc	gggcatgagg	tggtaggcga	ggtggtggag	300 360
gggtgctgcc atctggtcgt	gcgactgccg acaacgacgt	gccgtgcaag ctacaccgac	gccaacgttg ggaaagccca	agcagtactg cgcagggcgg	caacaagaag cttcgcctcc	420 480
tccatggtcg	tcgaccagaa	gttcgtggtg	aagatcccag	cggggctagc	gccggagcag	540 600
gcggcgccgc	rgergraege	tggcgtcacg cggcatcctc	grgradaged	acatagacca	catagacata	660
aaggtggcca	agtccatggg	ccaccacgtc	accgtgatca	gctcctccga	caagaagcgc	720
gccgaggcca	tggacgacct	gggcgccgac	gcctacctcg	tcagctccga	cgaggcccag	780
ataaccacca	ccatggactc	gctggactac	atcatcgaca	ccgtgcccgt	caagcacccg	840
ctcgagccct	acctcgcgct	gctcaagatg gtcccccatg	gacggcaagc	daggaagac	gggcgtcatt	900 960
agetteateg	ggagcatcga	ggagaccgag	gaggtgctca	ggtggttgt	cgacaagggc	1020
ctcacctcgc	agatcgaggt	cgtcaagatg	gactacctca	accaggcgct	tgagaggctc	1080
gagcgcaacg	acgtcaggta	ccgcttcgtc	gtcgacgtcg	cagggagcaa	catcgacgac	1140
actgccgcat	gatcaacttg	gcaacgacga	gcgaacctac	attgagcgcg	tgtgtttccg	1200 1260
tcttctatca	gagattcaga	gtgtgcatgt	tagtttcaat	aggaagaaat	gtttggtatg	1320
agtccggcct	aataataacg	gatttgctaa	aaaaaaaa			1358
<210> 146						
<211> 1051 <212> DNA						
<213> Loli	ım perenne					
<400> 146				,		CO
caatcatcca	gcccagatct	cacgcgtttc	cttcctccag	ctaaagaccg	gcaatggcga aacggcgccg	60 120
ccacggcggc	caaccacatc	acccaccact	ccaaggagca	gcacaagagc	ctgctccaga	180
acaacacact	ctaccagtac	atcctggaga	ccaccgtgta	cccgcgcgag	cacgagtgca	240
tgaagcagct	ccqcgaggac	accgccaacc	acccatggaa	cctgatgacc	acgtcggcgg	300
acgagggcca	gttcctcaac	ctgctcatca	agctcatcgg	cgccaagaag	accatggaga	360 420
cgatctta	catogacato	aaccoccaaca	actacogeget	catcggcaag	gaggacggca ccgtgcatcg	420
agaaggccgg	cgtcgcgcac	aagatcgact	tccgcgaggg	gcccgcgctc	ccggtgctcg	540
acgagctgct	cgaggacgag	gccaaccacg	gcaccttcga	cttcgtcttc	gtcgacgccg	600
acaaggacaa	ctacctcaac	taccaccagc	gcctcatgaa	gctcgtcagg	gtcggcggcc	660
tcctcggcta	cgacaacacg	taccoccact	gatccgtcgt	gctccccgcc	gacgcgccca gccctcgccg	720 780
rgcgcaagta	catcaagata	taccaactee	. coglectega	cggcatcacd	ctctgccgcc	840
gcgccaagtg	attgtctgat	tgatgacgcg	gagagagaga	cccctcggct	ccgctccgct	900

ccatggatgc ggacaagaat tctgtatctt cttggaaaca gacaaataat attactccta	aatattgtcc	ctttatgtac	ttttgccgtt gtatatcaaa	ctggctttct tttatatcca	960 1020 1051
<210> 147 <211> 1332 <212> DNA <213> Lolium perenne					
<pre><400> 147 gacgaatect accaaaccga gtectcgtec cegceteacc aacaccgtc ccatattaac geegeegegg acateggtc aagggcaceg teaggaaccc gccategacg getgecacgg caaatggtgg agceggeggt ggcacggtge ggcggatggt cgegggegg acgtggtcgt accaggaceg ggcggatggt cgegggegg acgtggtcgt accaggaceg ggcggatggt accaggaceg ggcggatggt cgcacgacgg ggtgacct cggcagegg aggtggacct cagcgacgg tgaacgcag aagttegca acgccgtgac cgcgaggacg tegtgegcat tgctccgacg aggcggaccc cagcgagacg tegtgcgat tgctccgacg aggcgaaccc gacctcggac tegaggaaccc cagagaaagg gcaccttcc gctgcagagc tgcaggcagg ccatactgct actgtcatgt gtaaaaaaaaa</pre>	gccggccggt tatcaacatg gcggcccgcc ctggctcgtc agacgacccg ctgcaaggcc cgtcttcac gaggggcacg gctcacctcc cgacgagtcg cgggaaggcg tgtggtggtg catcggcac ggcgtacgtg cgcgtccggc cctcgccaag gaggaagcag gaggaagcag gcggtgagc ggtgctcagc ggttaccatc	tctccgctcc acagtcgtcg gggaacgggc aagctgctgc aagaacgcgc gacctcctcg accgcatccc cagtacgtca tccatcggcg tgctggagcg gttgcggagc aacccggatgca acccgcacctct cctctccccg ccatacaaga cagtccctgt gagcaggcag cagcaggcag cgagcatgag	gagctatacg aggtcttagc agaccgtgtg tggagaaggg acctgagggc actacgacgc cagtcactga tagacgcggc ccgtcaccat acctcgactt aggcggcatc tggtgatcgg acctggacgg acgtggacga gggcgagcg agtaccccgt tgtctaacca acgagacggt aggcggacaa gagcggacaa gaacaagaaa	tecgtecgag tgceggegae tgtgaeegge gtaeaetgte getegaeege cateegeege egaeeeegg ggeggaggee ggaeeeeaae etgeaagaa ggagttggeg eceetgetg gteggeeage egeeeaeete egteeteae egeeeaaegg gaageteeag gaagaeete ggaageeete ggaaaeeetg teaaeeatg	60 120 180 240 300 360 420 480 540 600 660 720 780 840 900 960 1020 1080 1140 1200 1320 1332
<210> 148 <211> 1236 <212> DNA <213> Festuca arundin	acea				
<pre><213> Festuca arundin <400> 148 caagagctag ttcttctgtc caagtacagt ggtactgtaa gcctggccat gggcagaccg cgtcaagctg ctcctggaga tcccaagaac gcccacctga agccgacctc ctcgactacg ccacaccgcc tctccagtca cacggagtac gtgatcaaccg gtcgtcaatc ggtgccatca gtcctgctgg gagcaggctg cgtgaaccct gtgctcgtgg acacatcctc aagtacctcg cgtagacgtg cgtgacgtag gggccgtac caactcttc gcagccttat gaacgactct aagaggatca aagcaaacca gagggattaa tcacgtgctc ctgtaacatg atcgtgttat ttaagtgaac</pre>	catccgtagc gagcaacaat tgtgcgtcac gaggctacac aggcgctgga acgcatatg ccgatgatcc cggcagcgga ccatggaccc aattctgcaa cgtgggaggc tagggccgct acggctcggc ccggcgcgca agcgctgcgca agcgcgtgct ctgtgcaac ccgtgaagag ccgtgaagag ccgtgaagag acggtgtaac gcgtgaaac	gaccgttgtc cggcgccgcg cgtgaagggc cggcgcacc cgccgcgtc tgagcagatg tgcgggaacg caaccgcggt gaaaaccaag gccaggaag gctgcaacca catccgggtg gcaccgtggg aaggtgctct gcaggatctt cctccaggag ggcatgatac agttgttttt	gacgccgcg gggtacatcg acagtgagga gagaggctgcc gtggagccggg gtgcgccggg cctgacgtag aactggtact cgcggcatcg acggtgaacg gccaacgctg ttcgaggcgc gacgttgtcc gatgaagtga ggcctccagt aagggacatc	cgccgcagct cgtcggggct acccagatga tcctctgcaa acggcgtgtt cggtgcgggg tggtgttcac tcgtcaatga gctacggcaa acctcgtcgt ctagcgccgc tgcagtcata ctgaggctca actcgtcag acccacggaa tcactcctgt tcctagtacc gcagcagagt	60 120 180 240 300 360 420 480 540 600 720 780 900 960 1020 1080 1140 1236
<210> 149 <211> 1428					

<212> DNA <213> Festuca arundinacea

<400> 149	~~~~~~~~~	agatagatag	attacaccac	caccascata	accacatcca	60
cccccgateg	gcagacgcag	agatcgatgg ttcgccctcc	agetegeete	ctcatcatc	ctcccatca	120
ccctcaacga	caccatcaaa	cttggcctcc	tagagatact	autauccacc	gacaacaagt	180
cactaacccc	caccaaaata	gccgccaagc	teceatecae	aacaaaccca	gaagcgccgg	240
acataataaa	ccacatactc	cggctgctcg	catcatacaa	catcataaca	tacctaataa	300
accaeggegga	adacadacac	ctctcccgga	actacaacac	cacacccata	tgcaagttcc	360
tcaccccaa	casaascaac	gtctccatgg	caacactcac	gctcatgaac	caggacaagg	420
tecteatoga	gagctggtac	tacctcaagg	acqcqqtcct	tgacggcggc	atccccttca	480
		gcgttcgagt				540
		aaccactcca				600
accacggctt	ccagggcctc	ggcaccctcg	tcgacgtcgg	cggcggcgtc	ggcgccaccg	660
tggccgccat	cgccgcccac	taccccgcca	tcaagggggt	caacttcgac	ctccccacg	720
tcatctccga	ggcgccgcag	ttcccgggcg	tcacccacgt	cggcggcgac	atgttcaagg	780
aggtgccctc	gggcgacgcc	atcctcatga	agtggatcct	ccacgactgg	agcgaccagc	840
actgcgccac	gctgctcaag	aactgctacg	acgcgctgcc	ggcgcacggc	aaggtcgtgc	900
tcgtcgagtg	catcctgccg	gtcaacccgg	aggccaagcc	cagctcgcag	ggggtcttcc	960
acgtcgacat	gatcatgctc	gcgcacaacc	ccggcggcag	ggagaggtac	gagaggagt	1020
tcgaggccct	ggccagggga	gctgggttca	ccggcgtcaa	gtccacgtac	atctacgcaa	1080
acgcgtgggc	catcgagttc	accaagtaga	tgagatccct	ccggcctcca	tgcatccagg	1140
caacctccca	ccgatatgag	aacgatcgtc	gtcgatcttg	ctggctgctg	cctctgctcc	1200
tgcatcgatc	tgcatacgta	ccctttgctt	ggtttttcct	ctgttttccc	taattttctc	1260
		tgatggctgt				1320
aggttgcgta	tgttgtatac	ttgtatgtga	tgtaatgaga	tgatttctct	cctttgttga	1380
atactcgagt	aaattgaagt	gactctcatc	ttcctctgaa	aaaaaaa		1428
<210> 150						
<211> 1455						
<212> DNA						
<213> Loli	ım perenne					
	L					
<400> 150						
ctctcgctca		gcccaccagc				60
ctctcgctca atcgatgggc	tccaccgccg	ccgacatggc	cgcgtccgcc	gacgaggacg	cgtgcatgtt	120
ctctcgctca atcgatgggc cgccctccag	tccaccgccg ctcgcttcct	ccgacatggc cgtcggtcct	cgcgtccgcc cccgatgacg	gacgaggacg ctgaagaacg	cgtgcatgtt ccatcgagct	120 180
ctctcgctca atcgatgggc cgccctccag tggcctcctg	tccaccgccg ctcgcttcct gagatcctgg	ccgacatggc cgtcggtcct tggccgccgg	cgcgtccgcc cccgatgacg cggcaagtcg	gacgaggacg ctgaagaacg ctgaccccga	cgtgcatgtt ccatcgagct ccgaggtggc	120 180 240
ctctcgctca atcgatgggc cgccctccag tggcctcctg cgccaagctc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac	gacgaggacg ctgaagaacg ctgacccga atggtggacc	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg	120 180 240 300
ctetegetea ategatggge egecetecag tggeetectg egecaagete getgetegeg	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct	120 180 240 300 360
ctctcgctca atcgatgggc cgccctccag tggcctcctg cgccaagctc gctgctcgcg ctcccggagc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc	gacgaggacg ctgaagaacg ctgaccccga atggtggacc gagggcaagg acccccaacg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt	120 180 240 300 360 420
ctetegetea ategatggge egecetecag tggeetectg egecaagete getgetegeg eteceggage etecatggeg	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta	120 180 240 300 360 420 480
ctetegetea ategatggge egecetecag tggeetectg egecaagete getgetegeg eteceggage etecatggeg ectcaaggae	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcggcat	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc cccgttcaac	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga aaggcctacg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc	120 180 240 300 360 420 480 540
ctetegetea ategatggge egectecag tggectectg egecaagete getgetegeg etceeggage etceatggeg ecteaaggae gttegagtae	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcggcat acccgcgctt	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa	120 180 240 300 360 420 480 540
ctetegetea ategatggge egecetectg tggeetectg egecaagete getgetegeg eteceggage etecatggeg ecteaaggae gttegagtae ecactecate	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcggcat acccgcgctt agaagctcct	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgagctctac	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg	120 180 240 300 360 420 480 540
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctcccggagc ctccatggcg cctcaaggac gttcgagtac ccactccatc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcggcat acccgcgctt agaagctcct gcggcgtcgg	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgagctctac cgccaccgtg	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta	120 180 240 300 360 420 480 540 600
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctcccggagc ctccatggcg cctcaaggac gttcgagtac ccactccatc cagcctcgtc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac ccaaccgcgtc cgagctctac cgccaccgtg cccccacgtc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt	120 180 240 300 360 420 480 540 600 660 720
ctctcgctca atcgatgggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc cagcctcgtc cccaccatc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgcg gcgtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac ccaaccgcgtc cgagctctac cgccaccgtg cccccacgtc gttcaaggag	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat	120 180 240 300 360 420 480 540 600 720 780
ctctcgctca atcgatgggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc cagcctcatc cccaccatc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgcg gcgctcgcg gcggtccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcggcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactgagag	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgagetctac cgccaccgtg cccccacgtc gtcaaggag cgaccagcac	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgag cacggcttcg gcgccatag atctccgagg gtgccctcgg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa	120 180 240 300 360 420 480 540 600 720 780 840
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg cctcaatggcg cctcaatgac gttcgagtac ccactccatc cccaccatc cccaccatc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgcg gcgctcgcg gcgctcctg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca accgcgcat acagccgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgagctctac cgccaccgtg cccccacgtc gtcaaggag cgaccagcac ggtcgtgctc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg gtgccacgc gtcgagtgca	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgcggt	120 180 240 300 360 420 480 540 660 720 780 840 900
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc ccgcgcgtc ccccaccatc cccgggcgtc cctcatgaag ctgctacgag ctgctacgag ctgctacgac cacccggag gcacaccc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgcg gcgctcgcg gcgstccttg cacggcacgg atcatcacca gacgtcggcg aagggggtca accacgtcg tggatcctcc gcgctgccgg gccaatccca gqcqqcaggg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggaa cgcacggcaa gctcgcagga agacggcag agaggtacga	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgcaccgtg ccccacgtc gtcaaggac ggaccagac ggtcgtgctc ggtcttcaac ggtcgtgtctc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg tgcgcacgc gtcgagtgca gtcgactga gtcgacttga	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc	120 180 240 300 360 420 480 540 660 720 780 840 900 960
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc ccgcgcgtc cccaccatc cccgggcgtc cctcatgaag ctgctacgag ctgctacgac cctcatgaag ctgctacgac cctcatgaag ctgctacgac cctatccac cccgggcgtc cctcatgaag ctgctaccac ccgacacccc cggattcacc	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggaa cgcacggcaa gctcgcaggg agaggtacga ccacgtacat	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgcaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgtctc ggtcttcaac ggtcgtgtctc ggtcttccac gagggagttc ctacgccaac	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg tgcgccacgc gtcgagtgca gtcgactga gtgacatga caggctctcg	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgcccacta cgcccagtt gagacgccat tcctgcggt tcatgctcg ccagggag tcatgctcg	120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc ccggcgtc cccaccatc cccgggcgtc cctcatgaag ctgctacgac gtgctacgac cctcatcac cccgggcgtc cctcatgaag ctgctaccac caaccccc caagaag	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggaa cgcacggcaa gctcgcagga agatggcacat acacgtacat aagcatcaat aagcatcag	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc cccgttcaac caaccgcgtc cgcaccgtg ccccaacgtc gtcaaggag cgacagcac ggtcgtgctc ggtcttcaac gaggagttc ctacgcaac gaggagttc ctacgcaac gagacatgtc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg tgcgccacgc gtcgagtgca gtcgacatga caggctctcg gcgtgggcca cacggttat	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgcccaagtt gagacgccat tcctgccggt tcatgctcg ccagggagc tcatgctcg	120 180 240 300 360 420 480 540 600 720 780 900 900 1020 1080 1140 1200
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc ccgggcgtc cctcatgaag ctgctacgac cctcatgaag ctgctacgac caccacc ccgggggtc cctcatgaag ctgctacgac caaccacc caagtagat gcacaaccc cggattcacc cggattcacc cgagtagat gtcgtcgat	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcg gcgctccttg cacggcacgg	ccgacatggc cgtcggtcct tggccgccgg cgaacccgga tcgtgacgtg cgcccgtgtg tcatgaacca acggcgcat acccgcgctt agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcagga agaggtacga agaggtacga cacgtacat aagcatccag ctgccgctgc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc ccaccgctc cgagctctac cgccaccgtg cccccacgtc gttcaaggag cgaccagcac ggtcgtctc ggtcttccac gagggagttc ctacgccaac gcaacatgtc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg tgcgcacgc gtcgagtgca gtcgacgtca gtcgacgtca gtcgacatga caggcttcg gcgacatga caggctctcg gcgtgggca ccaccgatat atcaccttt	cgtgcatgtt ccatcgagct ccgaggtggc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgcccacta cgcccagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcgc ccaggggagc tcgagttcac gagaacgatc gagaacgatc gcttggtttt	120 180 240 300 360 420 480 540 660 720 780 900 900 1020 1140 1200 1260
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaaggac gttcgagtac ccactccatc ccgggcgtc cctcatgaag ctgctacgac cctcatgaag ctgctacgac cctcatgaag ctgctacgac caaccccc ccagagtac caacccc catgatacccc cagattcact cctcatgat	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcgctcgcg atcatcacca gacgtcggcg atcgcgcg atcgcgcg acgtcgcgg gccaatccca gcgctgccgg gccaatccca gcggcgcagg ggcgtcaagt agatcctcc ttgctggctg tccctaattt	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcggcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcagg agaggtacga cacgtacat cacgtacat cacgtacat ctgcacgg tcgcacgg ccacgtacat ccacgtacat ctgccgctgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttctc ggacaaggtc ccaccgttcaac cgcaccgtg ccccacgtc gttcaaggag cgaccagcac ggtcgtctc ggtcttccac gagggagttc ctacgccaac gagggagttc ctacgccacc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccctcgg tgcgcacgc gtcgagtgca gtcgacatga caggctccg gcgtggcca gcgtggccatga cagctctcg gcgtggccatga cagctctcg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt ccaggggggc ccaggggggc ccaggggggc ccaggggagc tctaggttcac gagaacgatc gcttggttt atggttgtgt	120 180 240 300 360 420 480 540 600 660 720 780 900 900 1020 1140 1200 1260 1320
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg ctccatggcg cctcaatgac ccactccatc ccggcgtc cccaccatc cccgggcgtc cctcatgaag ctgctacgac catccatc cccggagt ctcatgaag ctgctacgac caacccggag gcacaaccc cagattcac cagtagatc tcctctgttt	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgcg gcgctcgcgc gcggtccttg atcatcacca gacgtcggcg atcatcacca gacgtcggcg atcatcacca gacgtcggcg ggctactcc ggctgccgg gccaatccca ggcggcaggg ggcgtcaagt agatcctcc ttgctggctg tccctaattt ctcqqaatgt	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacatga caggcttcg gcgtgggca caggcttct gcgtgggca tcgacatta acacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 900 1020 1080 1140 1200 1320 1380
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaatggcg cctcaacgtac ccactccatc ccggcgtc cctcatgaag ctgctacgac cctcatgaag ctgctacgac catccatc cccgggcgtc cctcatgaag ctgctacgac caaccccggat gcacaaccc caagtagatc tcctctgttt cgccgatct cctcttgtt	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg atcatcacca gacgtcggcg atcgcgcg atcgcgcg gcgcacgcg gcgcacgcg ggcgcacgcg tggatcctcc tggctgccgg gccaatccca ggcggcaggg ggcgtaagt agatcctcc ttgctggctg tcctaattt ctcggaatgt gtgatgtaat	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacatga caggcttcg gcgtgggca caggcttct gcgtgggca tcgacatta acacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgct aggacggcgt gctggtacta gcatgtcggc ggatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt ccaggggggc ccaggggggc ccaggggggc ccaggggagc tctaggttcac gagaacgatc gcttggttt atggttgtgt	120 180 240 300 360 420 480 540 600 720 780 900 1020 1080 1140 1200 1320 1380 1440
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg ctccatggcg cctcaatgac ccactccatc ccggcgtc cccaccatc cccgggcgtc cctcatgaag ctgctacgac catccatc cccggagt ctcatgaag ctgctacgac caacccggag gcacaaccc cagattcac cagtagatc tcctctgttt	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg atcatcacca gacgtcggcg atcgcgcg atcgcgcg gcgcacgcg gcgcacgcg ggcgcacgcg tggatcctcc tggctgccgg gccaatccca ggcggcaggg ggcgtaagt agatcctcc ttgctggctg tcctaattt ctcggaatgt gtgatgtaat	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg accccaacg ctcatggaga aaggcctacg ttcaacgaag cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacatga caggcttcg gcgtgggca caggcttct gcgtgggca tcgacatta acacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 900 1020 1080 1140 1200 1320 1380
ctctcgctca atcgatggc cgcctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaatgac ccactccatc ccgggcgtc cctcatgaag ctgctacgac ccaccatc cccgggcgtc cctcatgaag ctgctacgac caacccggag gcacaaccc caagtagac gcacaaccc caagtagat gtcgtcatca ccagtagat gtcgtctgtt cctcttgtt cgcgatct aagtgaaaa aagtgaaaaa	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacggcgccg gcgctcgcgc gcggtccttg atcatcacca gacgtcggcg atcgcgcg atcgcgcg gcgcacgcg gcgcacgcg ggcgcacgcg tggatcctcc tggctgccgg gccaatccca ggcggcaggg ggcgtaagt agatcctcc ttgctggctg tcctaattt ctcggaatgt gtgatgtaat	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga aaggcctacg ttcaacgacg cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacttcg gcgtgacttcg gcgtgacatga acaggcttccg gcgtgggcca ccaccgatat atcacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 1020 1080 1140 1200 1320 1380 1440
ctctcgctca atcgatggc cgccctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg ctccatggcg cctcaatgac ccactccatc ccgggcgtc cccaccatc cccgggcgtc cctcatgaag ctgctacgac catccatgc cctcatgaag ctgctacgac catcctgtc cctcatgaag ctgctacgac caacccggag gcacaacccc caggattcacc caggattcacc caggattcacc caagtagatg tcctctgttt cgccgatctt cgccgatctt aagtgaaaaa <210> 151	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacgcgccg gcgctcgcgc gcggtccttg accacgacacgg atcatcacca gacgtcgcgc gagggtca acccacgtcg tggatcctc gcgctgccgg gccaatccca ggcggcaggg gccaatccca tgcgcgcagg gcctaagt agatcctcc ttgctggctg tccctaattt ctcggaatgt gtgatgtaat aaaaa	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga aaggcctacg ttcaacgacg cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacttcg gcgtgacttcg gcgtgacatga acaggcttccg gcgtgggcca ccaccgatat atcacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 1020 1080 1140 1200 1320 1380 1440
ctctcgctca atcgatggc cgccctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg cctcatggag cctcaatgaac ccactccatc cccggcgtc cctcatgaag ctgctacgac cctcatgaag ctgctacgac cctcatgaag ctgctacgac cctcatgaag ctgctacgac caacccggag gcacaacccc caggattcacc caggattcacc caggattcacc caggattcacc caagtagatg gtcgtcgatc tcctctgtt cgccgatctg atacttgtat aagtgaaaaa <210> 151 <211> 2101	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacgcgccg gcgctcgcgc gcggtccttg accacgacacgg atcatcacca gacgtcgcgc gagggtca acccacgtcg tggatcctc gcgctgccgg gccaatccca ggcggcaggg gccaatccca tgcgcgcagg gcctaagt agatcctcc ttgctggctg tccctaattt ctcggaatgt gtgatgtaat aaaaa	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtgag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gtcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gacaacatgtc tcctgcatcg taatccatt acqatgttct	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga aaggcctacg ttcaacgacg cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacttcg gcgtgacttcg gcgtgacatga acaggcttccg gcgtgggcca ccaccgatat atcacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 1020 1080 1140 1200 1320 1380 1440
ctctcgctca atcgatggc cgccctccag tggcctcctg cgccaagctc gctgctcgcg ctccatggcg cctcaaggac ctcaaggac ccactccatc ccgcgagctc cccaccatc cccgggcgtc cctcatgaag ctgctacgag ctgctacgag ctgctacgac caacccggag gcacaacccc caggattcacc caggattcacc caggattcacc caagtagatg gtcgtcgatc tcctctgtt cgccgatctt cgccgatct cactcatgta aagtgaaaa <210> 151 <211> 2101 <212> DNA	tccaccgccg ctcgcttcct gagatcctgg ccgtccgcgg tcgtacaacg tacgcgccg gcgctcgcgc gcggtccttg accacgacacgg atcatcacca gacgtcgcgc gagggtca acccacgtcg tggatcctc gcgctgccgg gccaatccca ggcggcaggg gccaatccca tgcgcgcagg gcctaagt agatcctcc ttgctggctg tccctaattt ctcggaatgt gtgatgtaat aaaaa	ccgacatggc cgtcggtcct tggccgcgg cgaacccgga tcgtgacgtg cgccgtgtg tcatgaacca acggcgcat agaagctcct gcggcgtcgg acttcgacct gtggcgacat acgactggag cgcacggcaa gctcgcaggg agaggtacga ccacgtacat aagaatcga ctgccgtcgc tctcatgctc	cgcgtccgcc cccgatgacg cggcaagtcg agcgccggac cctggtggag caagttcctc ggacaaggtc caaccgcgtc cgagctctac cgccaccgtg ccccacgtc gttcaaggag cgaccagcac ggtcgtgctc ggtcttccac gagggagttc ctacgccaacg gaccagcat gtcttcac gagggagttc ctacgccaacg gtcgtgctc	gacgaggacg ctgaagaacg ctgacccga atggtggacc gagggcaagg acccccaacg ctcatggaga aaggcctacg ttcaacgacg cacggcttcg gccgccatag atctccgagg gtgccaccgc gtcgagtgca gtcgacttcg gcgtgacttcg gcgtgacatga acaggcttccg gcgtgggcca ccaccgatat atcacccttt ctgaattta gaaaaggttg	cgtgcatgtt ccatcgagct ccgaggtgc gcatactccg acggccgcct aggacggcgt gctggtacta gcatgtcggc gatgaagaa agggtctcgg ccgccacta cgccgcagtt gagacgccat tgctcaagaa tcctgccggt tcatgctcg ccagggagc ccagggagc tcgagttcac gagacgatc gagatcac gagatcac gcttggttt atggttgtt cgtatgttgt	120 180 240 300 360 420 480 540 600 720 780 900 1020 1080 1140 1200 1320 1380 1440

<400> 151						
	aaacccacgc	gatccaacac	cccctagaga	aaaacaaaaa	caaaaagatt	60
acagtttctg	gtttgagtat	caatcgatgg	tagacttcac	taagatcgcc	atggagtgga	120
tccaagatcc	actgagctgg	ctattcatca	cctccataat	tttcataatt	ctgcagcggc	180
aacaacaaaa	caacgtggcg	ccatttccc	caaacccaaa	accactacca	atcotcooca	240
acatotcoat	gatggaccag	ctcacccacc	ataacctaac	ggcgctagcg	aaggagtacg	3.00
acaacettet	ccacatccgg	ctcggtaagc	tccacacctt	taccatatca	acqccaqaqt	360
	ggtgctgcag					420
ccatcgcgta	cctcacctac	gaccgagccg	acatggcgtt	cgcgcactac	gggcccttct	480
ggcgccagat	gcgcaagctg	tacataataa	agetetteag	ccadcaccac	ccggagacgt	540
aactcaccat	gcgcgacgag	tecgeggete	tegteegege	cgtggccagg	cggaccggcg	600
agtccgtgga	cctcggcgag	ctcattttta	aactcaccaa	gaatgtcatc	ttccgcgccg	660
cattcaaaac	tggtgcggtc	gccgccgacg	ccgaggaggg	cgacggagca	gggaagcagg	720
acqaqttcat	cgccatcctc	caggagttct	ccaagctctt	cggcgccttc	aacatcggag	780
acttcatccc	gtggctgagc	tgggcggacc	cgcagggcat	caacgtgcgc	ctccgcgccg	840
	cctcgacgag					900
agaatcccga	tgatgccgat	gccgacatgg	tggacgacat	gctcgcgttc	ctcccggagg	960
cqaagccgaa	gaagggcgcc	gccggcgacg	gcgtggacga	cctgcagaac	acgctccgcc	1020
tcacccgcga	caacatcaag	gccattatca	tggacgtgat	gtttggcggg	acggagacgg	1080
tggcgtcggc	gatcgagtgg	gcgatggcgg	agatgatgca	cagccccgac	gacctccgcc	1140
gcctgcagca	ggagctcgtc	gacgtggtgg	ggctcgaccg	gaacgtggac	gagtcggacc	1200
tcgacaagct	ccccttcctc	aagtgcgtca	tcaaggagac	gctccggctg	cacccgccca	1260
tcccgctgct	cctccacgag	accgccgagg	actgcgtcgt	cggcggctac	tccgtgcccc	1320
ggggctcccg	cgtcatgatc	aacgtctacg	ccatcggccg	cgaccgcagg	gcgtggaagg	1380
acgccgacgt	gttccggccg	tcgcggttcg	tgcaggggga	aggggaggcc	gccgggctcg	1440
acttcaaggg	gggatgcttc	gagttcctgc	ccttcgggtc	aggccgccgc	tcctgccctg	1500
gcatggcgct	cggcctgtac	gcgctggagc	tcgccgtggc	gcagctcgcg	cacggtttca	1560
gctgggagct	gcccgacggg	atgaagccgt	cggagctgga	catgagcgac	gtcttcggcc	1620
tcaccgcccc	gcgcgccacc	aggctcttcg	ccgtgcccac	gccccgcctc	gcatgcaccc	1680
agctgctggg	agctgacgac	gccgggcgcc	aggcgtgacg	gccattgctg	tgttagcaag	1740
cgatcgatgg	tatatgtacc	agctggccgg	aagatgaagg	tgtttgatat	attcagaggt	1800
gatggcggag	gcgccattgg	tggagcttgg	tggttttatc	ttgcttttt	tttactattt	1860
ttcttatact	ttgaactcaa	ttaagtctgg	tgacaacaga	acacaataag	cggattatca	1920
tgcttgctgg	atgcatgctt	ggatacagtg	ttaagcatga	tgtgttctac	catgaagaac	1980
gcaaattgta	aaaacaagtt	tttagacctg	ctgcaccgag	attctgtatt	ttcttcctct	2040
tggttttcca	tcgtgagtac	tatattaatg	ccaggatgat	agttccagtt	gaaaaaaaaa	2100
a						2101
<210> 152						
<211> 2460						
<212> DNA						
<213> Loli	um perenne					
<400> 150						
<400> 152	acgatcaaca	atatasast	ccacatacac	acacacacac	acacacacca	60
greeregea	agctagctta	cttactataa	tacttctttc	casatatcca	tagaatcaa	120
ageagegeee	gccaacggcg	ataacctata	cataacacaa	ccaactcaca	ccgaccctct	180
gaacgeegee	aaagcagccg	addadctatc	taggagccat	cttgatgccg	tgaagcgaat	240
autagagaa	taccgccgcc	ctataataac	catagaaggc	accaacctaa	ctatcgccat	300
ggtggaggag	gtggctgccg	acaccascsc	cagggtggag	ctcgacgagt	ccacccacaa	360
acacatcaaa	gagagcagcg	actgggtcat	gaacagcatg	accaacaaca	ccgacagcta	420
caatatcacc	accggcttcg	gtgccacctc	ccaccadada	accaaggagg	ataacactct	480
ccadadadad	ctcatcaggt	ttctcaatgc	gggagcattc	ggcaccggca	gcgatggcca	540
catectacee	gctgcgacga	caaaaactac	catacttatc	catatcaaca	ccctqctcca	600
gggctagtct	ggtatccgct	ttgagatect	cgagacggtc	gccacgcttc	tcaacgccaa	660
cotoacacco	tgcctaccgc	tccaaaacac	gatcacggca	tccggtgacc	tcqttccqct	720
gtcctacate	gcgggccttg	tgaccaacca	cccaaattct	gtggcgactg	ctccggatgg	780
cacgaaggtt	aacgctgcag	aggcattcaa	aatcqcqqqc	atccagcacq	gtttctttqa	840
actacaacct	aaggaaggcc	ttgccatggt	caacggcacc	gcggtgggct	ccggactggc	900
atccataata	ctcttcgagg	ctaacatcct	tggcatcctc	gctgaggttc	tgtcggctgt	960
attetataaa	gtcatgaacg	gcaagccaga	gtacaccgac	cacctcacgc	acaagttgaa	1020
gcaccaccct	ggtcagattg	aggccqcqqc	tatcatggag	cacatccttg	aaggaagctc	1080
ctacatgatg	ctcgcgaaga	agctcgqcqa	gctcgaccca	ctgatgaagc	cgaagcaaga	1140
taggtatqcc	cttcgaacat	caccgcaatg	gctgggccct	cagattgagg	ttatccgtgc	1200
cgccaccaag	tccatcgagc	gcgagatcaa	ctccgtcaac	gacaacccgc	tcatcgacgt	1260
ctctcgaggc	aaggccatcc	atggtggcaa	cttccagggc	acacccatcg	gtgtgtccat	1320
		-				

ggataacacc aggcttgcca	ttgctgcgat	cggcaagctc	atgtttgccc	agttctctga	1380
gctagtgaac gacttctaca	acaatggttt	gccttccaat	ctctcgggtg	ggcgcaaccc	1440
gagcttggac tatggcttca	agggtgctga	gattgccatg	gcctcctatt	gctccgagct	1500
ccaattcttq ggcaaccctg	tgactaacca	tgtgcagagt	gcggagcagc	acaaccaaga	1560
cgtcaactct cttggtctca	tctctgctag	gaagacctct	gaggccatcg	atattctgaa	1620
gctcatgtca tcgacattct	tggttgcact	gtgccaagct	atcgacctcc	gccacctcga	1680
ggagaatgtc aagaatgccg	tcaagaactg	tgtgaagatg	gtggctagga	agaccctgag	1740
caccaatgac agtggccatc	tccacagcgc	acgcttctgc	gagaaggacc	tgctcttgac	1800
gategacege gaggeggtgt	tcgcctacgc	agacgaccct	tgcagcgcta	actacccact	1.860
gatgcagaag atgcgtgcag	ttctcgtgga	gcacgccttg	gccaacggtg	aggctgagcg	1920
ggatgtgcag acgtcagtgt	tcgccaagct	tgccgcattc	gagcaggagc	tccgtgcagt	1980
gcttccaagg gaggtcgagt	cagcccggtg	tgctgtggag	aatggcaccg	ccgcgcagca	2040
aaaccgcatc accgaatgcc	ggtcgtaccc	gctgtaccgc	ttcgtgcgca	aggagctcgg	2100
aaccgagtac ttgaccggag	agaagacgag	gtctcctggt	gaagaggtgg	acaaggtgtt	2160
tgtggctatg aaccagggga	aacacatcga	cgcactgctt	gagtgcctca	aggagtggaa	2220
cggtgagccc ctgcctatct	gctgaagaat	gaatcaagga	actgaagaat	agagtacttg	2280
agagttcaga aggctccaca	tgtgcttagt	taatagtaag	tatagtactg	ttttttcatt	2340
gtatcttgtg cattatatat	acatgtaaca	ctggaataaa	atttcaaaaa	atcagatcac	2400
tcaatgggca gcatgtaaca	ctggaataaa	aatttcaaaa	aaatcagatc	aaaaaaaaa	2460
1010> 150					
<210> 153					
<211> 2595 <212> DNA					
<212> DNA <213> Festuca arundin	2002				
(213) rescued arandin	acca				
<400> 153					
ctcctctgta attcgagctc	ctcttcagca	caagtacttc	caccagagtg	ccagacaaca	60
atccagcacc acttccagaa	tacatacaca	cacgtacccg	tgtctaaacc	ttacttgctt	120
tcctagttct ttgcatatct	ccatggagtg	cgagaacggg	cacgttgccg	ccaacggcga	180
tggcctctgc gtggcgcagc	cagcccgggc	cgaccctctc	aactggggga	aggcagcaga	240
ggagctgtcc gggagccatt	tggatgccgt	gaagcggatg	gtcgaagagt	accgcagacc	300
agtcgtgacc atggagggcg	ccagcttgac	cattgctatg	gtcgccgcgg	tggccgccgg	360
cgccgacacc cgggtggagc	tcgacgagtc	cgcccgcgga	cgcgtcaagg	agagcagcga	420
ctgggtcatg aacagcatgg	cgaacggtac	cgacagctat	ggtgtcacca	ccggcttcgg	480
cgccacctca caccggagga	ccaaggaggg	tggcgctctg	cagagagagc	tcatcaggtt	540
ccttaacgcg ggagcatttg	gcaccggcag	cgatggccat	gttttgcccg	ctgcaacaac	600
cagggcggcc atgctcgtcc	gtgtcaacac	tctgctccag	gggtactctg	gcatccgctt	660 720
cgaaattctc gagacgatcg	ccacgcttct	caatgccaac	gtgacgccgt	geetaceget	720
ccggggcaca atcacggcat	ccggcgacct	cgtcccatta	tcctacatcg	eeggeerigi	840
gactggccgc ccaaactctg	tggcgacagc	tecagatgge	agcaaggita	acycaycaya	900
ggctttcaag attgccggca tgccatggtc aacggcactg	tecageatgg	ccccccgag	tageageeea	t+t+ccaacc	960
taacatcctt ggcatccttg	ccgaggttct	atcaaccata	ttctgcgagg	tgatgaatgg	1020
caageeggag tacacegace	acctaacaca	caagetgaag	caccacccaa	gccagatcga	1080
ggccgcggcc atcatggagc	acateettga	aggcagctcc	tacatgatgc	tcgcgaagaa	1140
gctcggtgag ctcgacccac	tgatgaagcc	aaaacaagat	aggtatgcac	tccgcacatc	1200
accacaatgg ctcggccctc	agatcgaggt	catccgtgct	gctaccaagt	ccatcgagcg	1260
tgagatcaac tccgtcaacg	acaacccact	catcgacgtc	tcccgcggca	aggctatcca	1320
cggtggcaac ttccagggca	cgcccatcgg	tgtgtccatg	gacaacacca	ggcttgccat	1380
tgcggccatc ggcaagctca	tgtttgccca	gttctcggag	cttgtgaacg	atttctacaa	1440
caacggtttg ccttccaatc	tctctggtgg	gcgcaatccg	agcttggact	atggcttcaa	1500
gggtgctgag attgctatgg	cctcatactg	ctccgagctc	cagttcttgg	gcaaccctgt	1560
gactaaccat gtgcagagcg	ccgagcagca	caatcaagac	gtcaactctc	tcggcctcat	1620
ctcttccagg aagaccgctg	aggcgattga	cattttgaag	ctcatgtcct	cgacattcat	1680
ggttgccttg tgccaagcta	tcgacctccg	ccacatcgag	gagaatgtca	agaatgccgt	1740
caagaactgt gtgaagacgg	tggctaggaa	gaccctgagc	accaatgaca	gtgggcatct	1800
ccacaatgca cgcttctgcg	agaaggacct	gctcctgacg	atcgaccgtg	aggcggtgtt	1860 1920
cgcctacgca gatgaccctt	gcagcgccaa	ctacccgctg	arguagaaga	catacatatt	1920
tctcgtggag catgccttgg	ccaacggtga	ageegageag	gacycgcaga	cgreagigit	2040
cgccaagett gccacatteg	agcaagagct	. ccg.gcggtt	aaccccaagg	aggicgagic	2100
tgcccggtgt tccgtggaga gtcatacccg ctctatcgct	tacygeaccgc	. cycacaycag	actoractatt	traccrrara	2160
gaagacgagg tctcctggtg	. ceytycydaa . aadadd+dda	. ggageteggg . caaddtattt	attactata	accaddutaa	2220
gaagacgagg teteetggtg					2280

gcacattgac gcgctgcttg agtgcctcaa ggagtggaac ggtgagcccc tgcctatctg ctgaagaatg gctcaaggaa ctcaagaata gagtgcttga gaattcagat ggtactgtt

tataattata totooggata togatgtttg caatgttoot coagagotgo aatgcoagtt

2280 2340

agaaaagata atagcatgac gttagtaaaa gggtacactt ttatatcaat gttctgtcta ctgccaaaaa aaaaa	tgtgataaat	atacataatt	attgcactag	tcctttattt	2460 2520 2580 2595
<210> 154 <211> 1382 <212> DNA <213> Lolium perenne					
qgccacaact cgccacatct ggcttctagc cgtgtcctgg accaagatca gccacctgcc cgtgcaggc ttctacaag gccacctgcc gatcgcaca cccaacgtca cgctctcctc gcacaggct tccgtgcac cgacggct caacgtcac gccacacc cgcgctatcc gcgcgac accctcccc accacgac accctcccc cgcgctatcc gcacaggct acccacgac ttcccgcag accaccgac ttccagagaca tacgtcacc gcacaccac gccacaccac gccacaccac gccacaccac gccacaccac accacagac accaccac gccacaccac gccacaccac accacagac accaccac gccacaccac accacagac attcgacca gccaggaca atacgcaacc gcctgtggat aggttgtt tgtagctta agtttctgaaaa acgacatagaaaa	tectegtegt gtgetecaet gtgetecaet cgeaggeege cegtgeteet cgetegeege tegeegeege tegeegegg aceteaceae gattectege cgetegaat cecteaaeaa acaceaceaa tgeteaaeeg ageecaeegt cegtegteaa cegtegteaa cegtegteaa gattgeteege cggtegteaa gattgeteege cggtegatea gattgeteege cggtegatea cggtegatea cggtegatea cggtggtaat geaactegae	ggcagctctg accgccgctg gtccatcgtc gctcctccgc cgacaagacc caccgccttc cgctctcctgc gccgcactac catcatcaac caagatcagc gtggttcgcg caacgacatc caccaggttc gatgggccag gcccaacaaa ggccgccag tctctagct ggtttgggt cactgt	gcgatctccg gccaagggcc ttcaacttcc atccacttcc ggcggcaccg aaggccatca gccgacatcg gccgtcccgc gcctcccgg ctcgacgcca acctccttcc tcgcagctca cgcacccca ttcacctccg gccgtcgacc atcaacgtgc ggccgtcacca agcttggtgt acgtacttc ttgagagcca atcacgagat	tgtccgccac tgaacttcga tccgcgacgc acgactgctt acagcgagaa acgacctccg ccgccctggc tcggccgccg caccgagctc acgacctcgt aggagcgcct ggctcacctg acgtcttcga accaggacct tcaccggcag acgacctt tcaccggcag acgacgacct tgtagatatg ttcccaaagt cagttgatgc ggtttttggt	60 120 180 240 300 360 420 480 540 660 720 780 840 900 960 1020 1080 1140 1200 1260 1320 1380 1382
<210> 155 <211> 1260 <212> DNA <213> Lolium perenne					
<pre><400> 155 atcgccttc tcctccatgg ggcgacgacg gcgctggtt aggttctggg ctgtccgtcg ccggcgaact gtcaccaagg cctcttctt cacgactgcg ggcagggcg atggcgagg ggtcattagc gacgccaagg tgacattctc gccetcgccg ggcgaggag atggtgacg ccttaccgac ggcgcgcgtcg cctcacggc atggtgacg cgacaccacc atggtgagg cgacaccacc atggtgagg cgacaccacc atggtgagg cgacacggcg cttggcg cgacacggcg gcgctcgtc cttcgttgcg gcgatggtc gatccggctc tactatatgt ttgggaaag tcatttgtt tcatatggt tagcttacac</pre>	tgctgatcgt ggttctacaa cctttgagaa ttgtccgagg gggactcgaa gagacccttga gagacccttga gatggcctcgt attctcagct attctcagct attctcagct acttctacga ccgtgacgacgt acttctacga cagacgacgt acgacgacgt aggtgaccacga aggtgaccacga aggtgagaaata	gctgttcgca gaagttgtgt ggagcctggc gtgcgacgca ggcaaacaac gaagctctgc ctccaaggaa cgtggaaaac gcacaccatc ggcggcgg gacgccgtc cggctccgac ccgcgagccc gatggaggtg gtatataacc cgttcttctt tatacacatt	tcgccggcaa ccgaaggcgg accccggccg tcggtgctgc cccagcttgg ccgcaaaccg gctagcgggc gacgaggttc ttcacggcaa ggcacctcgc cctgaccacgg ccggagacag gtgatggaca gtagggcta gccgagtact ctcaccgggg ggttgctgcg gttgtgttaat tgtttgcgtc	cggtggcgaa agaaggtcgt acatcatccg tggaatccac atgggtttga tctcctgtgc tcgactatgc tccctagtgt aaggctttac actgctcgtc accetgcgct cggcgcagaa accagtacta tggagagccc gggccaagcg ccgagggga tttgtctctg gtttttctt ataaactgta	60 120 180 240 300 360 420 600 660 720 780 840 900 960 1020 1140 1200 1260

```
<210> 156
<211> 1204
<212> DNA
<213> Lolium perenne
<400> 156
atccccaaac ccaaaaggtg aggcctccag atacttggat ctccaatggc tcctgctact
                                                                       60
cccaaggaca getetgetet geetggtttg etettgetet tegeageage gaegteegtg
                                                                      120
                                                                      180
gcggtagcga acgcacagct atcagagaac tactacgggt cttcttgtcc caccgcgctt
                                                                      240
ctcaccatca ggactgtcgt gacgacggcg gtgctgctgg accaccgcat gggcgcttct
cttctccggc tccacttcca cgactgcttt gtgcaagggt gcgacgcgtc cgttctgctg
                                                                      300
gatgacacgg ccggcttcac cggcgagaag ggggccgggc cgaacgccgg gtcgctgcgc
                                                                      360
ggtctggagg tgatcgacaa gatcaagatg ctgctggagt tcatgtgccc gcggaccgtc
                                                                      420
tectgegeeg acatectege egtegeegee egegacteeg tegteegtet aggggggeea
                                                                      480
                                                                      540
tcatgggcgg ttcaacttgg aaggagggac gccaccacag caagcgcgtc acttgctagt
                                                                      600
agtgacctcc caggccccaa ctccaacctc aatgatctcc tcaccgcttt ctccaaaaaa
ggactaagca ccacggacat ggttgctcta tcaggggccc ataccatcgg ccgggcgcag
                                                                      660
tgccagaact accggaaccg gatctacacc gacaccgaca ttgacggggc attcgcagcg
                                                                      720
                                                                      780
tecetgegag geggetgeec acaggeegge ggegaeggea acetegegee getegaegeg
                                                                      840
tectetecea acacettega taaeggetae tteteeggee teeteteeeg ecaggggetg
ctccattccg accaggeget gtacgacgge ggetecacgg acgatetggt caggacetae
                                                                      900
gcctccaata acgatcagtt tggcagcgac ttcgctgcgg cgatggtgaa actgagcaat
                                                                      960
atcggcctgc tgacggggtc gtccggggag atcagggtca actgccgggc ggtgaattaa
                                                                     1020
cgatggatgg atgggggcat catgaaacga acaaggcgtg cgatttccgg aactgcaggc
                                                                     1080
                                                                     1140
aacgaaactg catatttatg tacactgcct atttattcc tgtccttgtg tccccgtctt
gttatattac atccataatc catgttaaga tggtggcatt ggtttaaaaa aaaaaaaaa
                                                                     1200
                                                                     1204
aaaa
<210> 157
<211> 1530
<212> DNA
<213> Lolium perenne
<400> 157
actcattcat ctgtcgtctc ctgcttccct caagcttaga tcgattgcag ccggccgggg
                                                                       60
                                                                      120
actgttgagc taccactgcc ggtcgctggt acgagcggac gtaaggagag atccagatgg
                                                                      180
ccgcgacgat gaccgtggag gaggtgagga aggcacagcg ggcggagggg ccggcgacgg
                                                                      240
tgctggccat cggcacggcg acgcccgcta actgtgtcta ccaggctgac tacccggact
                                                                      300
actacttcaa gatcaccaag agcgaccacc tcgccgatct caaggagaag ttcaagagga
tgtgcgacaa gtctcagatc aggaagaggt acatgcacct gacggaggag atcctggagg
                                                                      360
                                                                      420
agaaccccaa catgtgcgcg tacatggcgc cgtcgctgga cgcgcgccag gacatagttg
togtogaggt coogaagcto gggaaggogg oggcacagaa ggcgatcaag gagtggggoo
                                                                      480
                                                                      540
agccgcggtc caagatcacc cacctcgtct tctgcactac ctctggtgtg gacatgccag
gcgccgacta ccagctcacc aagatgctcg gcctgcgccc gtcggtgaag cgcctcatga
                                                                       600
tgtaccagca gggctgcttc gccggcggca cggtgctccg cctcgccaag gacctggctg
                                                                       660
                                                                      720
aaaacaaccg cggcgcgcg gtgctggtgg tctgctcgga gatcacggcc gtgaccttcc
                                                                      780
geggeeegea egagteacac etegaetege tggteggeea ggegetette ggggaeggeg
ctgccgcggt gataatcggc gccgaccccg acgtgtccgt cgagcgcccg ctgttccagc
                                                                      840
                                                                      900
tggtgtcggc gagccagacc atcctgccgg actcggaggg cgccatcgac ggccacctca
gggaggtcgg cctcaccttc cacctcctca aggacgtgcc cgggctcatc tccaagaaca
                                                                      960
tcgagcgcgc cctggaggaa gccttcaagc cgctcggcat cgacgactgg aactccgtct
                                                                      1020
tttgggtggc gcacccgggc gggccggcga tcctcgacat ggtggaggca aaggtaaacc
                                                                      1080
tcaacaagga gcggatgcgt gccaccaggc acgtcctctc cgagtacggc aacatgtcca
                                                                      1140
gcgcatgcgt cctcttcatc atggacgaga tgcgcaagcg ctctgccgag gatggtcaca
                                                                      1200
ccaccaccgg cgagggaatg gattggggcg tcctctttgg cttcgggccc ggcctcaccg
                                                                      1260
togagacogt tgtcctccac agcatgccca ttgccgctga tgccaccgct tgatcgatgg
                                                                      1320
ttccatctcc gtttatctgc cacatcgatg gatacctact actactaccg ccgccgccgc
                                                                      1380
tgctatccaa agtaatttgt attgtattca tgcatacctg gtttgtattt gttggtagga
                                                                      1440
                                                                      1500
ttcgttccgc tattatgtcg cttgtgtcgc gtacactgtt gtatcctagt aatagtaatc
                                                                      1530
aaacggagta cggtttatgt aaaaaaaaa
<210> 158
<211> 1418
<212> DNA
<213> Festuca arundinacea
```

<400> 158						60
gaaaagacag	cacagaaatc	tatattctac	aaggcagaaa	agagcagcag	gggaaateta	60 120
gctaaggtct	tgagaggaag	atgaagcagg	aggtgaagag	cgagatgaac	ggcgagacga	180
tgagcggcaa	caaagggccg	gtggtggtga	ccggggcgtc	gggtttegte	gggtcatggc	240
tcgtcatgaa	gctccttcag	gcggggtaca	ccgtccgggc	caecgigege	gacccctggga	300
acgtcgagaa	gacgaagcca	ttgctggagc	ttcccggagc	caaggagegg	tagaaaaaaa	360
ggcgtgccga	cctgagcgag	gaaggcagct	tcgacgaggc	categeggge	rgcaceggeg	420
tcttccacgt	cgccacgccc	atggacttcg	agtccaagga	ccctgagaac	gaagugatta	480
agccgacggt	ggaagggatg	ctgagcatca	tgagagcgtg	taaggaggcc	ggcaccgcca	540
agcgcgtcgt	cttcacctcc	reegeeggea	ccgtcaacat	ccacatcaaa	atracarrac	600
cctacgacca	ggacaactgg	taggacateg	acttctgccg agaaggccgc	catagactac	acgaeaggae	660
agatgtactt	cgtgtccaag	ataataaaa	cgctcgtcgt	cacggactac	ctcaacacca	720
acggcgtgga	cttcatcage	accacactaa	cactcatcac	addascasa	acceactact	780
geatgeegee	cageetggte	ctcctcctgg	tggacgacct	ctacaactcc	atgacctacc	840
tottogaa	cccaggigeag	aacaaccact	acatctgctc	ctcccacgac	accaccattc	900
atagastaga	caccatacta	aacggccgct	tccccgagta	cgacatccca	cagaaattcc	960
caaaaatcaa	caacaacctc	carccratco	acttcttctt	caagaagctg	ctcgaccacg	1020
agttagatt	caddacacc	accasaass	tgttcgacgc	cacaatctaa	acatacaaaa	1080
agaagggct	gattccgctc	gaagagaaa	gggcaggcgg	cccaaccaat	gcagccggca	1140
agaagggeee	tatteteata	ggcgaaggtc	aggcgattgg	tactaaaaca	taagcgctag	1200
tacatataca	ctaggctggc	tacctcagac	acatggtgga	gcgatgatta	tgttcgttaa	1260
ttctactatc	ctatatttcq	gttcagaaat	tgcattaaga	gaaccctgta	attggtggga	1320
tattatgaac	ggattatgga	acocaaataa	cttcatgaca	aaaaaaaaaa	aaaaaaaaa	1380
aaaaaaaaaa	aaaaaaaaa	aaaaaaaaaa	aaaaaaaa			1418
aaaaaaaaa						
<210> 159		*				
<211> 1209						
<212> DNA						
<213> Loli	um perenne					
<400> 159						60
gagcaccaca	catggcgact	gaagccaagg	gggagacggt	gctggtcacc	ggcgccagcg	60 120
gcttcatcgg	ctcctggctc	gtccgcctcc	tcctcgcccg	cggctactcc	gtccacgccg	180
ccgtcctcaa	ccccgatgac	aaggccgaga	cggaccacct	cctcgcgctc	geegergegg	240
ccggcgacga	gggccgcatc	cgcttcttca	ggtgcgacct	cctcgacggc	geegeeatge	300
tegeegeegt	gcggggatgc	teeggegtgt	tccacctcgc	acacacaca	accyccyacc	360
tegteetega	ccccagaag	gagettgtgg	tgccggcggt	ggagggcacg	tecateteca	420
tgcgcgccgc	caaggaagct	gggggagtgc	ggegggegge	ggrgaceree	teegteteeg	480
ccctcgtccc	etgeeegggg	aggeeggeeg	gcgaggtcct	ttcaaaggca	ctggcggaga	540
acategaeta	anachttaca	aacggggttt	ggcaccccgc	aataacaatc	aatccaggga	600
aggeggeatg	gaagtttgta	ccaccaaaac	tcaatgccag	catggcggte	tttcttcact	660
tagttttggg	ttacasaaaa	gagtatggg	atttcttcat	caaaccaata	cacgtggaag	720
accttgaagg	acccatatt	ctactataca	agaatccgtc	aggatccggg	aggcacctct	780
acgregeace	catctotcac	tagaatattt	tcgcggcgaa	agtcgccgag	ctctaccctg	840
attacaaact	tccaaaattc	cctgaggaca	cacagectgg	actaataaaa	gcggaggcgg	900
taccasagas	actastaaca	ttagatttac	agttcactcc	tcttgagaag	atcatcaggg	960
ataccataga	gaagatgaag	agcagaggat	gcatcgcctg	atgattggat	cgttaggcat	1020
gtcacccttc	catcatagat	tcatgatcat	ccttattgag	agatgtgttg	tgttgtgtcc	1080
agcccagtgc	ctacccagac	catatactta	ccagtatgat	ttgtgcaata	acagccggtt	1140
gatgtacggc	atcacctocc	ctacacttqq	gatgcggatg	ctgtcacact	gactccctca	1200
aaaaaaaa	_	22	, , , , , ,			1209
<210> 160						
<211> 1260						
<212> DNA						
<213> Loli	um perenne		•			
1100: 155						
<400> 160			•		+ + + + + + + + + + + + + + + + + + + +	60
gaaaagcttc	acacagettg	agaaaatggt	gagctcaacc	aayyycaaag	tgtgtgtaac	120
taggggcttca	ggctttgttg	cctcttggct	catcaagaaa	ataanaaa	ctggatatca	180
cgtgataggg	actgtcagag	acccagggaa	Logaagaaag	graygacacc	tttggaaact	240
tanaantaat	aaryayayyC	ccaacttgt	gagagetgat	gcatcaccto	aagggagctt tccttgggaa	300
atatasttas	. ytaayyyttt	grgagggtgt	acatactaca	atcaatcots	ccctcaacgt	360
alcidalico	. aarrycaagg	aaycaacact	. cgg.cc.gca	albaalyyto	. Journal of c	500

gctaagatcc	tgcaagaaga	gtccatttct	caaaagggtt	gttctcacat	cttcatcatc	420
cgcggtaagg	attagggatg	aaactcagca	gccagaactg	ttatgggatg	aaacgacatg	480 540
gagetetgtg	gcattggg	aaaagctaca ttgccaagga	getatggtat	gaccttgtga	cagttettee	600
atcattcota	attggacca	gtttatccca	tgaattgtgc	actactactt	cagatatcct	660
tggcttactt	caaggtgaca	cagacaggtt	cactttgtac	ggaaggatgg	gatatgttca	720
catcgatgat	gttgcccgga	gccacattct	agtgtacgaa	acaccggagg	caactggcag	780
atatctgtgc	agctcagtgg	ttctggataa	caatgaattg	gttggcttac	tggcaaaaca	840
gtttccagta	ttccccattc	caaggaggct	caagaacccc	tatggaaagc	aggcatacca	900
		aggggctggg				960 1020
taacgactgc	gtcgaatcgc	tgaaagatca ccatagccaa	aggecattig	caagccatag	ccaaacacat	1020
ctcaactato	cctgataatcat	gtcagttctc	gagtcataga	tttttttt	ctcttcaaat	1140
aattcccatq	tactctcctt	actataccga	acatcaattg	tcagcggcag	attaaatgtg	1200
		ttcaattagt				1260
<210> 161						
<211> 1438						
<212> DNA						
<213> Loli	m perenne					
<400> 161	229999999	tcgacgacac	accetacact	tcacaaatca	atcagatcag	60
adacyactec	caataataa	gagagcgccc	ttcctgccga	caaaaaaaaac	cacactacaa	120
ccatccttca	tacaaaacaa	ggacgagcgg	cccaaggtgg	cqcacqaccq	cttcagcgac	180
gaggtgcccg	tcatctcgct	ccacggcatc	gacgacgcgc	ggaggaccga	gatccgggac	240
cgcgtggcgg	cggcgtgcga	ggggtgggc	atcttccagg	tcgtcgacca	cggcgtcgac	300
gccgcgctca	tcgccgagat	ggccaggctc	tcgcgcgact	tcttcgcgct	ccccgccgag	360
gacaagctcc	gctacgacat	gtccggcggc	aagaagggcg	gattcatcgt	ctccagccac	420 480
ctccagggcg	agacggtcca	ggactggcgg gtggccggac	gagalegiga	agtaggagg	graceeggre	540
cadtacadcd	accaccycccy	ggcgctgtcc	tacaaactac	tagagatact	atcagagacc	600
atgggcctgg	agacggaggc	cctgtccaag	acatacataa	acatggacca	gaaggtggtg	660
gtcaacttct	accccaagtg	ccccagccc	gacctcaccc	tcggcctcaa	gcgccacacc	720
gaccccggca	ccatcaccct	cctcctccag	gacctcgtcg	gcggactcca	ggccacccgc	780
gacggcggca	acacctggat	caccgtacag	cccatcgccg	gcgcattcgt	cgtcaacctc	840
ggcgaccacg	gccactactt	gagcaacggg	aggtttaaga	acgcggacca	ccaggcggtg	900 960
grgaacgggg	agagcagcag	gctgtccatc gagggagggg	gecaegitee	tcctggagga	gcccgacgcc	1020
ttcaccgaga	tataccacca	caagatggcg	cacaacctca	agctcgccaa	gcgcaagaag	1080
caggccaagg	ccgatcagct	caagcagcag	ctgcagcagg	aggccgcgcc	cgccgccgcg	1140
cccaccaagc	cactcaacca	gattcttgcc	tagattccat	gccgattcat	tcatgcgtga	1200
tatatagtac	tatgtactat	atcgtattaa	aataagtaat	tatctctatc	tactcatttg	1260
tgtgtaatta	agagatgagt	aattatctag	tatatacaca	tttgtctgcg	aggagcgagc	1320
tggacctgta	ataacatgta	gcatgtccta	cgtggaaccg	atcagctgat	tggagctgtc	1380 1438
acatgagttt	gergrgrgea	gaaattgaac	gcatteggta	Cigcilicaa	aaaaaaaa	1430
<210> 162						
<211> 1214 <212> DNA						
<213> Loli	um perenne					
<400> 162						
gaaaatcccc	aaacccaaaa	ggtgaggcct	ccagatactt	ggatctccaa	tggctcctgc	60
tactcccaag	gacagctcta	gctctgctct	gcctggtttg	ctcttgctcc	tcgcagcagc	120
gacgtccgtg	gcggtagcga	acgcacagct	atcagagaac	tactacgggt	cttcttgtcc	180
caccgcgctt	ctcaccatca	ggactgtcgt	gacgacggcg	gtgctgctgg	accaccgcat	240 300
gggcgcttct	cttctccggc	tccacttcca ccggcttcac	caacagagaga	gradacadaa	cdaacdccdd	360
atcactacac	gatgacacyy	tgatcgacaa	gatcaagatg	ctgctggagt	tcatgtgccc	420
gcggaccgtc	tcctgcgccg	acatcctcgc	cgtcgccgcc	cgcgactccg	tcgtccgtct	480
aggggggcca	tcatgggcgg	ttcaacttgg	aaggagggac	gccaccacag	caagcgcgtc	540
acttgctagt	agtgacctcc	caggccccaa	ctccaacctc	aatgatctcc	tcaccgcttt	600
ctccaaaaaa	ggactaagca	ccacggacat	ggttgctcta	tcaggggccc	ataccatcgg	660
ccgggcgcag	tgccagaact	accggaaccg gcggctgccc	yatctacacc	gacaccgaca	acctcgcgcc	720 780
arregeageg	cooctgogag	geggetgeee	acayyeeyye	ggcgacggca	accedegee	100

ccag cagg actg ggtg actt tccc aaaaa <210 <211 <212	gggcagcagcagcagcagcagcagcagcagcagcagcagc	tg cgaaaaaaaagcaaaaaaaaaaaaaaaaaaaaaaaaa	tcca cctc tcgg gatg acga rttat	ttcc caat gcctg gatg aact	eg ac :a ac gc tg gg at :g ca	cago gato acgo gggg tatt	cgct agtt ggtc gcat	gta tgg gto cat	cgac cago cggg gaaa actg	ggc gac gag cga cct	ggct ttcg atca acaa attt	ccac ctgc gggt ggcc attt	egg a egg c eca a gtg c ecc t	cgat gatg ctgc gatt gtcc	ctcccg cctggt ggtgaa ccgggc ctccgg cttgtg	840 900 960 1020 1080 1140 1200 1214
<213	;> Lc	lium	ı per	enne	€											
Met 1		Ser		5	Val				10					15		
Tyr	Ala	Tyr	Ala 20	Pro	Leu	Pro	Ser	Ser 25	Ser	Asp	Asp	Ala	Arg 30	Glu	Asn	
Arg	Ser	Ser 35	Gly	Gly	Val	Arg	Trp	Arg	Ala	Cys	Ala	Ala 45	Val	Leu	Ala	
Ala	Ser 50		Leu	Ala	Val	Val 55		Val	Val	Gly	Leu 60	Leu	Ala	Gly	Gly	
Arg 65		Asp	Arg	Val	Pro 70		Gly	Ala	Asp	Val 75		Ser	Ala	Thr	Val 80	
	Ala	Val	Pro	Met 85	Glu	Phe	Pro	Arg	Ser 90		Gly	Lys	Asp	Leu 95		
Val	Ser	Glu	Lys 100		Ser	Gly	Ala	Tyr 105		Ala	Asp	Gly	Gly 110		Pro	
Trp	Ser	Asn 115		Met	Leu	Gln	Trp		Arg	Thr	Gly	Phe 125		Phe	Gln	
Pro	Glu 130		His	Tyr	Met	Asn 135		Pro	Asn	Gly	Pro 140		Tyr	Tyr	Gly	
Gly 145		Tyr	His	Leu	Phe 150		Gln	His	Asn	Pro 155		Gly	Asp	Ser	Trp 160	
	Asn	Ile	Ala	Trp 165	Ala	His	Ala	Val	Ser 170		Asp	Met	Val	Asn 175		
Arg	His	Leu	Pro 180		Ala	Met	Val	Pro 185		Gln	Trp	Tyr	Asp 190		Asn	
Gly	Val	Leu 195		Gly	Ser	Ile	Thr 200		Leu	Pro	Asp	Gly 205		Val	Ile	
Leu	Leu 210		Thr	Gly	Asn	Thr 215		Thr	Leu	Ala	Gln 220		Gln	Cys	Leu	
Ala 225		Pro	Ala	Asp	Pro 230		Asp	Pro	Leu	Leu 235	Arg	Glu	Trp	Ile	Lys 240	
	Pro	Ala	Asn	Pro 245	Ile	Leu	Phe	Pro	Pro 250		Gly	Ile	Gly	Leu 255	Lys	
Asp	Phe	Arg	Asp 260		Leu	Thr	Ala	Trp 265		Asp	His	Ser	Asp 270	His	Thr	
Trp	Arg	Thr 275		Ile	Gly	Ser	Lys 280	Asp	Asp	Asp	Gly	His 285	Ala	Gly	Ile	
Ile	Leu 290		Tyr	Lys	Thr	Lys 295		Phe	Val	Asn	Tyr 300	Glu	Leu	Met	Pro	
Gly 305		Met	His	Arg	Gly 310	Pro	Asp	Gly	Thr	Gly 315	Met	Tyr	Glu	Cys	Ile 320	*
	Leu	Туг	Pro	Val 325	Gly	Gly	Asn	Ser	Ser 330		Met	Leu	Gly	Gly 335	Asp	
Asp	Ser	Pro	Asp 340		Leu	Phe	Val	Leu 345		Glu	Ser	Ser	Asp 350	Asp	Glu	
Arg	His	Asp 355		Tyr	Ala	Leu	Gly 360		Phe	Asp	Ala	Val 365		Asn	Val	
Trp	Thr 370		Ile	Asp	Arg	Asp 375		Asp	Leu	Gly	Ile 380		Leu	Arg	Tyr	
Asp 385		Gly	Lys	Tyr	Tyr 390		Ser	Lys	Ser	Phe 395	Tyr	Asp	Gln	Lys	Lys 400	

129

Asn Arg Arg Ile Val Trp Ala Tyr Ile Gly Glu Thr Asp Ser Glu Gln 405 410 Ala Asp Ile Thr Lys Gly Trp Ala Asn Leu Met Thr Ile Pro Arg Thr 425 430 Val Glu Leu Asp Arg Lys Thr Arg Thr Asn Leu Ile Gln Trp Pro Val 435 440 Glu Glu Val Asp Thr Leu Arg Arg Asn Ser Thr Asp Leu Gly Arg Ile 455 460 Thr Val Asn Ala Gly Ser Val Ile Arg Leu Pro Leu His Gln Gly Ala 465 470 475 Gln Leu Asp Ile Glu Ala Ser Phe Gln Leu Asn Ser Ser Asp Val Asp 490 495 Ala Ile Asn Glu Ala Asp Val Gly Tyr Asn Cys Ser Thr Ser Gly Ala 505 Ala Val Arg Gly Ala Leu Gly Pro Phe Gly Leu Leu Val Leu Ala Asn $51\overline{5}$ 520 525 Gly Arg Thr Glu Gln Thr Ala Val Tyr Phe Tyr Val Ser Lys Gly Val 540 530 535 Asp Gly Gly Leu Gln Thr His Phe Cys His Asp Glu Ser Arg Ser Thr 545 550 555 560 Arg Ala Lys Asp Val Val Asn Arg Met Ile Gly Ser Ile Val Pro Val 565 570 575 Leu Asp Gly Glu Thr Phe Ser Val Arg Val Leu Val Asp His Ser Ile 580 585 590 Val Gln Ser Phe Ala Met Gly Gly Arg Ile Thr Ala Thr Ser Arg Ala 595 600 605 Tyr Pro Thr Glu Ala Ile Tyr Ala Ala Ala Gly Val Tyr Leu Phe Asn 615 620 Asn Ala Thr Gly Ala Thr Val Thr Ala Glu Arg Leu Val Val His Glu 625 630 635 Met Ala Ser Ala Asp Asn His Ile Phe Thr Asn Asp Asp Leu 645

<210> 164

<211> 620

<212> PRT

<213> Festuca arundinacea

195

<400> 164

Met Glu Ser Arg Ala Phe Pro Asn Ala Ala Tyr Ala Pro Leu Leu Pro 5 10 Pro Thr Ala Asp Asp Ala Thr Leu Gly Lys Gln Asp Arg Pro Gly Val 25 Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Ser Gly Val Val Val 40 Leu Leu Val Ala Ala Thr Met Leu Ala Gly Ser Arg Met Gly Gln Ala 55 Gly Asp Thr Asp Glu Asp Gly Ala Gly Gly Phe Pro Trp Ser Asn Glu 75 70 Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln Pro Glu Gly His 85 90 95 Phe Met Ser Asp Pro Asp Gly Pro Val Tyr Tyr Arg Gly Tyr Tyr His 100 110 105 Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp Asp Asp Tyr Ile 120 115 Glu Trp Gly His Val Val Ser Gln Asp Leu Val His Trp Arg Pro Leu 130 135 140 Pro Leu Ala Leu Arg Pro Asp His Trp Tyr Asp Lys Lys Gly Val Leu 150 155 Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu Val Leu Tyr 165 170 175 Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln Cys Ile Ala Val 180 185 190 Pro Thr Asp Pro Asn Asp Pro Leu Leu Arg His Trp Thr Lys His Pro

```
Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln Gly Met Asp Phe
                  215
                                  220
Arg Asp Pro Thr Ser Ala Trp Phe Asp Lys Ser Asp Ala Thr Trp Arg
                            235
            230
Ile Leu Ile Gly Ser Lys Asp Asp Asp Asn Gly Ser His Ala Gly Ile
        . 245 250
Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe Glu Arg Val Pro
                        265 270
         260
Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp Glu Cys Ile Asp
   275 280 285
Phe Tyr Pro Val Gly Gly His Asn Ser Ser Ser Glu Glu Leu Tyr
                  295
                                  300
Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp Tyr Tyr Ser Leu
305 310 315
Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro Leu Asp Ala Glu
          ,325
                 330
Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Leu Tyr Ala
                               350
         340
                  345
Ala Thr Ser Phe Tyr Asp Pro Leu Lys Gln Arg Arg Ile Met Leu Gly
                                    365
 355 360
Tyr Val Gly Glu Thr Asp Ser Ala Arg Ala Asp Val Ala Lys Gly Trp
 370 375
Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Thr Leu Asp Glu Lys Thr
                            395
385 390
Arg Thr Asn Leu Leu Leu Trp Pro Val Glu Glu Val Glu Ala Leu Arg
                           410
                                           415
           405
Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Val Asp Asn Gly Ser Val
                         425
                               430
Phe His Leu Pro Leu His Gln Ala Thr Gln Leu Asp Ile Glu Ala Ser
 435 440 445
Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn Glu Ala Asp Val
450 455
                                 460
Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala Arg Gly Ala Ile
     470
                              475
Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp Leu Arg Gly Glu
            485
                           490
                                           495
Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu Asp Gly Thr Leu
                                        510
       500
                        505
Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser Arg Ala Arg Asp
 515 520 525
Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val Leu His Gly Glu
 530 535 540
Ala Leu Ser Met Arg Val Leu Val Asp His Ser Ile Val Gln Ser Phe
                            555 560
      550
Ala Met Gly Gly Arg Val Thr Ala Thr Ser Arg Val Tyr Pro Thr Glu
                               575
           565
                          570
Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn Asn Ala Thr Gly
                                    590
         580
                      585
Ala Ser Val Thr Ala Glu Arg Leu Ile Val His Glu Met Ala Ser Ala
            600 605
   595
Val Tyr Asp Glu Thr Leu Ile Met Val Glu Asp Ser
          615
<210> 165
<211> 623
<212> PRT
<213> Festuca arundinacea
Met Glu Ser Arg Ala Phe Pro Ser Ala Ala Tyr Ala Pro Leu Leu Pro
                          10
Ser Ala Ala Asp Asp Val Ala Leu Ala Lys Gln Asp Arg Pro Gly Val
                      25
   20
Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Cys Gly Val Val Val
```

40 ,

Leu Leu Val Gly Ala Thr Leu Leu Ala Gly Ser Arg Met Gly Gln Ala 55 Gly Asp Gly Glu Gly Asn Thr Asp Glu Asp Gly Ala Gly Phe Pro 75 Trp Ser Asn Glu Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln 85 90 Pro Glu Gly His Phe Met Ser Asp Pro Asn Gly Pro Val Tyr Tyr Arg 100 105 110 Gly Tyr Tyr His Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp 115 120 125 Asp Asp Tyr Ile Glu Trp Gly His Val Val Ser Gln Asp Leu Val His 135 Trp Arg Pro Leu Pro Leu Ala Met Arg Pro Asp His Trp Tyr Asp Lys 145 150 155 Lys Gly Val Leu Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu 170 165 Val Leu Leu Tyr Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln 185 190 180 Cys Ile Ala Val Pro Thr Asp Pro Asn Asp Pro Leu Leu Arg His Trp 200 205 Thr Lys His Pro Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln 210 215 220 Gly Met Asp Phe Arg Asp Pro Thr Ser Ala Trp Trp Asp Lys Ser Asp 225 230 235 Ala Thr Trp Arg Ile Leu Ile Gly Ser Lys Asp Asp Asp Asn Gly Ser 250 255 245 His Ala Gly Ile Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe 270 260 265 Glu Arg Val Pro Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp 275 280 Glu Cys Ile Asp Phe Tyr Pro Val Gly Gly Gly His Asn Ser Ser Ser 290 295 300 Glu Glu Leu Tyr Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp 310 315 Tyr Tyr Ser Leu Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro 325 330 Leu Asp Ala Glu Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly 345 350 340 Lys Leu Tyr Ala Ser Thr Ser Phe Tyr Asp Pro Val Lys Gln Arg Arg 355 360 365 Ile Met Leu Gly Tyr Val Gly Glu Val Asp Ser Ala Arg Ala Asp Val 370 375 380 Ala Lys Gly Trp Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Ala Leu 390 395 Asp Glu Lys Thr Arg Thr Asn Leu Leu Leu Trp Pro Val Glu Glu Val 410 405 415 Glu Ala Leu Arg Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Ile Asp 420 425 430 Asn Gly Ser Val Phe His Leu Pro Leu His Gln Thr Thr Gln Leu Asp 435 440 Ile Glu Ala Ser Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn 450 455 460 Glu Ala Asp Val Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala 475 470 Arg Gly Ala Leu Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp 490 Leu Arg Gly Glu Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu 500 505 Asp Gly Thr Leu Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser 515 520 525 Arg Ala Arg Asp Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val 535 540 Leu Asp Gly Glu Ala Leu Ser Met Arg Val Leu Val Asp His Ser Ile 555 560 Val Gln Ser Phe Ala Met Gly Gly Arg Thr Thr Ala Thr Ser Arg Val

Tyr Pro Thr Glu Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn 585 Asn Ala Thr Gly Ala Gly Val Thr Ala Glu Arg Leu Ile Val His Glu 600 Met Ala Ser Ala Val Tyr Asp Glu Thr Leu Met Val Glu Asp Ser 610 615 620 <210> 166 <211> 619 <212> PRT <213> Festuca arundinacea Met Glu Ser Arg Asp Phe Pro Ser Ala Ala Tyr Ala Pro Leu Leu Pro 10 Ser Ala Ala Asp Asp Val Ala Leu Ala Lys Gln Asp Arg Pro Gly Val 20 25 Gly Trp Arg Gly Phe Leu Thr Val Leu Ala Ala Cys Gly Val Val Val 3.5 40 Leu Leu Val Ala Ala Ser Leu Leu Ala Gly Ser Arg Met Gly Gln Ala 55 Gly Asp Thr Asp Glu Asp Gly Ala Gly Gly Phe Pro Trp Ser Asn Glu 75 70 Met Leu Gln Trp Gln Arg Ala Gly Phe His Tyr Gln Pro Glu Gly His Phe Met Ser Asp Pro Asp Gly Pro Val Tyr Tyr Arg Gly Tyr Tyr His 100 105 110 Leu Phe Phe Gln Tyr Asn Arg Arg Gly Val Ala Trp Asp Asp Tyr Ile 125 115 120 Glu Trp Gly His Val Val Ser Gln Asp Leu Val His Trp Arg Pro Leu 135 140 Pro Leu Ala Met Arg Pro Asp His Trp Tyr Asp Lys Lys Gly Val Leu 155 145 150 Ser Gly Thr Ile Thr Val Leu His Asn Gly Thr Leu Val Leu Leu Tyr 165 170 Thr Gly Val Thr Glu Asp Pro Met Ala Glu Ser Gln Cys Ile Ala Val 190 180 185 Pro Thr Asp Pro Asn Asp Pro Leu Leu Arg His Trp Thr Lys His Pro 205 200 Ala Asn Pro Val Leu Ala His Pro Gln Gly Val Gln Gly Met Asp Phe 220 215 Arg Asp Pro Thr Ser Ala Trp Trp Asp Lys Ser Asp Ser Thr Trp Arg 230 235 Ile Leu Ile Gly Ser Lys Asp Asp Asp Asn Gly Ser His Ala Gly Ile 245 250 255 Ala Phe Ile Phe Lys Thr Lys Asp Phe Leu Ser Phe Glu Arg Val Pro 265 270 260 Gly Ile Val His Arg Val Glu Gly Thr Gly Met Trp Glu Cys Ile Asp 280 285 Phe Tyr Pro Val Gly Gly His Asn Ser Ser Ser Glu Glu Leu Tyr 295 300 Val Ile Lys Ala Ser Met Asp Asp Glu Arg His Asp Tyr Tyr Ser Leu 315 310 Gly Arg Tyr Asp Ala Ala Ala Asn Thr Trp Thr Pro Leu Asp Ala Glu 325 330 335 Leu Asp Leu Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Leu Tyr Ala 340 345 Ser Thr Ser Phe Tyr Asp Pro Leu Lys Gln Arg Arg Ile Met Leu Gly 360 Tyr Val Gly Glu Val Asp Ser Ala Arg Ala Asp Val Ala Lys Gly Trp 375 Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Ala Leu Asp Glu Lys Thr 395 390 Arg Thr Asn Leu Leu Trp Pro Val Glu Glu Val Glu Ala Leu Arg

410

PCT/NZ02/00239

Tyr Asn Ser Thr Asp Leu Ser Gly Ile Thr Val Glu Asn Gly Ser Ile 425 430 Phe His Leu Pro Leu His Gln Ala Thr Gln Leu Asp Ile Glu Ala Ser 440 4.3.5 Phe Arg Leu Asp Ala Ser Asp Val Ala Ala Ile Asn Glu Ala Asp Val 460 450 455 Gly Tyr Asn Cys Ser Ser Ser Gly Gly Ala Ala Ala Arg Gly Ala Leu 470 475 Gly Pro Phe Gly Leu Leu Val His Ala Ala Gly Asp Leu Arg Gly Glu 485 490 495 Gln Thr Ala Val Tyr Phe Tyr Val Ser Arg Ala Leu Asp Gly Ser Leu 500 505 510 Arg Thr Ser Phe Cys Asn Asp Glu Thr Arg Ser Ser Arg Ala Arg Asp 515 520 525 Val Thr Lys Arg Val Val Gly Ser Thr Val Pro Val Leu Asp Gly Glu 535 540 Val Leu Ala Met Arg Val Leu Val Asp His Ser Ile Val Gln Ser Phe 550 555 Ala Met Gly Gly Arg Val Thr Ala Thr Ser Arg Val Tyr Pro Thr Glu 565 570 575 Ala Ile Tyr Ala Arg Ala Gly Val Tyr Leu Phe Asn Asn Ala Thr Gly 580 585 590 Ala Ser Val Thr Ala Glu Arg Leu Ile Val His Glu Met Ala Ser Ala 595 600 Val Tyr Asp Glu Thr Val Met Val Lys Asp Ser 615 <210> 167 <211> 1075 <212> PRT <213> Lolium perenne <400> 167 Met Ala Gly Asn Asp Trp Ile Asn Ser Tyr Leu Glu Ala Ile Leu Asp 10 Ala Gly Gly Thr Ala Gly Asp Ile Ser Ala Ala Ser Val Ala Gly Gly 20 25 Asp Asp Gly Pro Gly Ala Gly Gly Gly Thr Ala Gly Glu Lys Arg Asp 35 40 Lys Ser Ser Leu Met Leu Arg Glu Arg Gly Arg Phe Asn Pro Ala Arg Tyr Phe Val Glu Val Ile Ser Gly Phe Asp Glu Thr Asp Leu Tyr 65 70 75 Lys Thr Trp Val Arg Thr Ser Ala Met Arg Ser Pro Gln Glu Arg Asn 90 8.5 Thr Arg Leu Glu Asn Met Ser Trp Arg Ile Trp Asn Leu Ala Arg Lys 105 110 100 Lys Lys Gln Ile Glu Gly Glu Glu Ala Ser Arg Leu Ser Lys Lys Arg 120 125 Leu Glu Arg Glu Lys Ala Arg Arg Asp Ala Ala Asp Leu Ser Glu 135 140 Asp Leu Ser Glu Gly Glu Lys Gly Glu Asn Ile Asn Gly Ser Ser Val 150 155 His Asp Glu Ser Thr Arg Gly Arg Met Pro Arg Ile Gly Ser Thr Asp 170 175 165 Ala Ile Glu Val Trp Ala Asn Gln His Lys Asp Lys Lys Leu Tyr Ile 180 185 190 Val Leu Ile Ser Ile His Gly Leu Ile Arg Gly Glu Asn Met Glu Leu 200 Gly Arg Asp Ser Asp Thr Gly Gly Gln Val Lys Tyr Val Val Glu Leu 210 220 210 215 Ala Arg Ala Leu Gly Glu Thr Pro Gly Val Tyr Arg Val Asp Leu Leu 225 230 235 Thr Arg Gln Ile Ser Ala Pro Asp Val Asp Trp Ser Tyr Gly Glu Pro

250

Thr	Glu	Met	Leu 260	Ser	Pro	Arg	Asn	Ser 265	Glu	Asn	Leu	Gly	Asp 270	Asp	Met
Gly	Glu	Ser 275		Gly	Ala	Tyr	Ile 280	Val	Arg	Ile	Pro	Phe 285	Gly	Pro	Arg
Glu	Lys 290		Ile	Pro	Lys	Glu 295		Leu	Trp	Pro	His 300	Ile	Gln	Glu	Phe
Val 305		Gly	Ala	Leu	Val 310	His	Ile	Met	Gln	Met 315	Ser	Lys	Val	Leu	Gly 320
	Gln	Val	Gly	Arg 325	Glu	Arg	Arg	Val	Trp 330	Pro	Val	Val	Ile	His 335	Gly
His	Tyr	Ala	Asp 340	Ala	Gly	Asp	Ser	Ala 345	Ala	Leu	Leu	Ser	Gly 350	Ala	Leu
		355					360			Leu		365			
	370					375				Arg	380				
385					390					Glu 395					400
				405					410	Gln				415	
			420					425		Met			430		
		435					440			Gly		445			
	450					455				Ser	460				
465					470					Glu 475					480
				485					490	Arg				495	
			500					505		Pro			510		
		515					520			His		525			
	530					535				Arg Ser	540				
545					550					555 Tyr					560
				565					570					575	
			580					585		Phe			590		
		595					600			Ala		605			
	610					615				Gly	620				
625					630					635 Tyr					640
				645					650					655	
			660					665		Tyr			670		
		675					680			Arg		685			
	690					695				Ser	700				
705					710					715 Asp					720
				725					730					735	
			740					745	ı	Val			750		
		755	i				760	1		Thr		765	1		
	770		<u></u>			775			***		780			-	-

Pro Ser Leu Arg Arg Arg Lys His Ile Val Val Ile Ala Val Asp Ser 790 795 Val Gln Asn Ala Asp Leu Val Gln Ile Ile Lys Asn Leu Phe Glu Ala 810 Ser Arg Lys Glu Lys Ser Ser Gly Ala Val Gly Phe Val Leu Ser Thr 820 825 Ser Arg Ala Ile Ser Glu Thr Leu Thr Phe Leu Thr Ser Gly Gly Ile 840 845 835 Gln Thr Thr Glu Phe Asp Ala Phe Ile Cys Ser Ser Gly Ser Asp Leu 855 860 Cys Tyr Pro Ser Ser Ser Ser Glu Asp Met Leu Ser Pro Thr Glu Leu 870 875 Pro Phe Met Ile Asp Leu Asp Tyr His Ser Gln Ile Glu Tyr Arg Trp 885 890 Gly Gly Glu Gly Leu Arg Lys Thr Leu Ile Arg Trp Ala Ala Glu Asn 905 910 900 Asn Ser Gln Ser Gly Gln Glu Val Val Thr Glu Asp Glu Glu Cys Ser 925 920 Ser Thr Tyr Cys Ile Ser Phe Lys Val Lys Asn Thr Glu Ala Val Pro 940 935 Pro Val Lys Asp Leu Arg Lys Thr Met Arg Ile Gln Ala Leu Arg Cys 945 950 955 His Val Leu Tyr Ser His Asp Gly Ser Lys Leu Asn Leu Ile Pro Leu 965 970 975 Leu Ala Ser Arg Ser Gln Ala Leu Arg Tyr Leu Tyr Ile Arg Trp Gly 990 985 980 Val Glu Leu Ala Asn Met Thr Val Val Val Gly Glu Ser Gly Asp Thr 995 1000 1005 Asp Tyr Glu Gly Leu Leu Gly Gly Val His Lys Thr Ile Ile Leu Lys 1010 1015 1020 Gly Ser Phe Asn Ala Ala Pro Asn Gln Leu His Ala Ala Arg Ser Tyr 1025 1030 1035 1040 Ser Leu Glu Asp Val Ile Ser Phe Asp Lys Pro Gly Ile Ala Ser Val 1045 1050 1055 Glu Gly Tyr Leu Pro Asp Ser Leu Lys Ser Ala Leu Gln Gln Phe Gly 1060 1065 Val Leu Asn 1075 <210> 168 <211> 938 <212> PRT <213> Lolium perenne <400> 168 Met Ala Ala Gly Asn Glu Trp Ile Asn Gly Tyr Leu Glu Ala Ile Leu 5 10 Asp Ala Gly Ser Lys Leu Arg Pro Gln Gly Val Gln Leu Pro Pro Leu 20 30 Glu Thr Ala Pro Ala Leu Ala Ala Glu Glu Ser Ser Ala Ala Tyr Asn 40 Pro Thr Arg Tyr Phe Val Glu Glu Val Val Arg Ser Phe Asp Glu Gln 55 60 Ala Leu His Lys Thr Trp Thr Lys Val Val Ala Met Arg Asn Ser Gln 70 75 80 Glu Arg Ser Asn Arg Leu Glu Asn Leu Cys Trp Arg Ile Trp Asn Val 9.5 85 90 Ser Arg Gln Lys Lys Gln Val Glu Trp Asp Tyr Thr Lys Glu Val Ala 105 100 Arg Arg Lys Leu Glu Gln Glu Leu Gly Ser Arg Glu Ala Ala Glu Asp 115 120 125 Leu Ser Glu Leu Ser Glu Gly Glu Lys Asp Thr Thr Thr Ala Lys Pro 130 135 140 Asp Ala Ala Ala Gln Pro Ser Ala Asp Asp Gly Glu His Gln Gln 150 155

Pro Gln Pro Arg Thr Arg Leu Ala Arg Ile Asn Ser Glu Val Arg Leu 170 Val Ser Asp Asp Glu Glu Glu Gln Thr Lys Lys Arg Asn Leu Tyr Ile 180 185 Val Leu Ile Ser Ile His Gly Leu Val Arg Gly Glu Asn Met Glu Leu 200 205 Gly Arg Asp Ser Asp Thr Gly Gly Gln Val Lys Tyr Val Val Glu Leu 215 220 Ala Arg Ala Leu Ala Ala Thr Ala Gly Val His Arg Val Asp Leu Leu 225 230 235 Thr Arg Gln Ile Ser Cys Pro Asp Val Asp Trp Thr Tyr Gly Glu Pro 245 250 Val Glu Met Leu Glu Arg Leu Ser Ser Ala Asp Ala Asp Asp Asp Asp 260 265 270 Gly Glu Gln Ala Gly Gly Gly Ala Tyr Ile Val Arg Leu Pro Cys Gly 280 285 Pro Arg Asp Gln Tyr Ile Pro Lys Glu Glu Leu Trp Pro His Ile Pro 300 295 Glu Phe Val Asp Arg Ala Leu Ser His Val Thr Glu Val Ala Arg Ala 305 310 315 Leu Gly Glu Gln Leu Gln Pro Pro Pro Ser Pro Ala Asp Gly Ala Val 325 330 335 Ala Ala Pro Ile Trp Pro Tyr Val Ile His Gly His Tyr Ala Asp Ala 340 345 350 Ala Glu Val Ala Ala Asn Leu Ala Ser Ala Leu Asn Val Pro Met Val 360 365 Met Thr Gly His Ser Leu Gly Arg Asn Lys Leu Glu Gln Leu Leu Lys 375 Leu Gly Arg Met Pro Gly Pro Glu Ile Gln Gly Thr Tyr Lys Ile Ala 390 395 400 Arg Arg Ile Glu Ala Glu Glu Thr Gly Leu Asp Thr Ala Glu Met Val 405 410 415 Val Thr Ser Thr Lys Gln Glu Ile Glu Glu Gln Trp Gly Leu Tyr Asp 420 425 430 Gly Phe Asp Leu Met Val Glu Arg Lys Leu Arg Val Arg Gln Arg Arg 435 440 Gly Val Ser Ser Leu Gly Arg Tyr Met Pro Arg Met Ala Val Ile Pro 450 455 460 Pro Gly Met Asp Phe Ser Phe Val Glu Thr Gln Asp Thr Ala Asp Gly 470 475 480 Asp Gly Ala Asp Leu Gln Met Leu Ile Ala Pro Asp Lys Ala Lys Lys 485 490 495 Ala Leu Pro Pro Ile Trp Ser Asp Val Leu Arg Phe Phe Thr Asn Pro 500 505 His Lys Pro Met Ile Leu Ala Leu Ser Arg Pro Asp Pro Lys Lys Asn 515 520 Val Thr Thr Leu Leu Lys Ala Tyr Gly Glu Ser Arg Gln Leu Arg Glu 530 535 540 Leu Ala Asn Leu Thr Leu Ile Leu Gly Asn Arg Asp Asp Ile Glu Asp 555 560 550 Met Ala Gly Gly Gly Ala Val Leu Thr Ala Val Leu Lys Leu Ile 565 570 575 Asp Arg Tyr Asp Leu Tyr Gly Gln Val Ala Tyr Pro Lys His His Lys 580 585 590 Gln Thr Asp Val Pro His Ile Tyr Arg Leu Ala Ala Lys Thr Lys Gly 595 600 605 Val Phe Ile Asn Pro Ala Leu Val Glu Pro Phe Gly Leu Thr Ile Ile 615 620 Glu Ala Ala Ala Tyr Gly Leu Pro Val Val Ala Thr Lys Asn Gly Gly

630

645

Pro Val Asp Ile Leu Lys Ala Leu His Asn Gly Leu Leu Val Asp Pro

His Ser Ala Glu Ala Ile Thr Gly Ala Leu Leu Ser Leu Leu Ala Glu
660 665 670

Lys Ser Arg Trp Val Glu Cys Arg Arg Asn Gly Leu Arg Asn Ile His
675 680 685

635

137

Arg Phe Ser Trp Pro His His Cys Arg Leu Tyr Leu Ser His Val Ser 695 700 Thr Tyr Cys Asp Gln Pro Ser Pro His Gln Pro Leu Arg Val Pro Leu 710 715 Ala Leu Gly Ser Ser Thr Ser Phe Gly Ala Asp Asp Ser Leu Ser Asp 730 725 Ser Leu Arg Gly Leu Ser Leu Gln Ile Ser Val Asp Ala Ser Ser Asp 740 745 750 Leu Asn Ala Ala Asp Ser Ala Ala Ala Ile Met Asp Ala Leu Arg Arg 755 760 765 Arg Pro Ala Ser Glu Lys Pro Ala Ser Ser Gly Ala Arg Ala Leu Gly 770 775 780 Phe Ala Pro Gly Arg Arg Glu Ser Leu Leu Val Val Ala Val Asp Cys 785 790 795 Tyr Gly Asp Asp Gly Lys Pro Asp Val Glu Gln Leu Lys Lys Ala Ile 805 810 Asp Ala Ala Val Ser Val Gly Glu Cys Ala Gly Ala Lys Gln Gly Tyr 830 820 825 Val Leu Ser Thr Gly Met Thr Ile Pro Glu Ala Ala Glu Ala Ile Lys 840 845 Ala Cys Gly Ala Asp Val Ala Ser Phe Asp Ala Leu Ile Cys Ser Ser 850 855 Gly Ala Glu Leu Cys Tyr Pro Trp Lys Glu Leu Val Ala Asp Glu Glu 865 870 875 Tyr Ser Gly His Val Ala Phe Arg Trp Pro Gly Asp His Val Lys Ser 885 890 895 Ala Val Pro Arg Leu Gly Ser Met Glu Glu Ile Ala Leu Ala Ile Asp 900 905 910 Arg Pro Ala Ser Ser Val His Cys His Ala Tyr Ala Ala Thr Asp Ala 915 920 925 Ser Lys Val Ser Ile Thr Glu His Tyr Leu <210> 169 <211> 808 <212> PRT <213> Lolium perenne <400> 169 Met Ala Ala Lys Leu Thr Arg Leu His Ser Leu Arg Glu Arg Leu Gly $1 \hspace{1cm} 5 \hspace{1cm} 10 \hspace{1cm} 15$ Ala Thr Phe Ser Ser His Pro Asn Glu Leu Ile Ala Leu Phe Ser Lys 25 Tyr Val His Gln Gly Lys Gly Met Leu Gln Arg His Gln Leu Leu Thr 40 Glu Phe Glu Ala Leu Phe Glu Ala Asp Lys Glu Arg Tyr Ala Pro Phe 50 55 60 Glu Asp Ile Leu Arg Ala Ala Gln Glu Ala Ile Val Leu Pro Pro Trp 75 70 Val Ala Leu Ala Ile Arg Pro Arg Pro Gly Val Trp Asp Tyr Ile Arg 90 Val Asn Val Ser Glu Leu Ala Val Glu Glu Leu Thr Val Ser Glu Tyr 105 100 Leu Ala Phe Lys Glu Gln Leu Val Asp Glu His Ala Ser Ser Lys Phe 120 125 Val Leu Glu Leu Asp Phe Glu Pro Phe Asn Ala Ser Phe Pro Arg Pro 135 140 Ser Met Ser Lys Ser Ile Gly Asn Gly Val Gln Phe Leu Asn Arg His 150 155 Leu Ser Ser Lys Leu Phe Gln Asp Lys Glu Ser Leu Tyr Pro Leu Leu 165 170 175 Asn Phe Leu Lys Ala His Asn His Lys Gly Thr Thr Met Met Leu Asn 180 185 190 Asp Arg Ile Gln Ser Leu Arg Gly Leu Gln Ser Ala Leu Arg Lys Ala

200

WO 03/040306 PCT/NZ02/00239 .

Glu	Glu 210	Tyr	Leu	Thr	Ser	Ile 215	Pro	Glu	Asp	Thr	Pro 220	Ser	Ser	Glu	Phe
Asn 225	His	Arg	Phe	Gln	Glu 230	Leu	Gly	Leu	Glu	Lys 235	Gly	Trp	Gly	Asp	Thr 240
				245			Ile		250					255	
			260				Glu	265					270		
		275					Ser 280					285			
	290					295	Thr				300				
305					310		Asn			315					320
	_		_	325			Lys		330					335	
			340				Суз	345					350		
		355					Leu 360					365			
	370					375	Ser				380				
385					390		Ala			395					400
				405			Gly Leu		410					415	
			420				Tyr	425					430		
		435					440 Phe					445			
_	450					455	Phe				460				
465					470		Val			475					480
				485			Arg		490					495	
			500					505					510		
_		515					Ser 520 Lys					525			
	530					535	дуз Asp				540				
545					550		Pro			555					560
				565			Gly		570					575	
			580					585					590		
		595					Asn 600 Glu					605			
	610					615					620				
625					630		дуs Arg			635					640
				645			Val		650					655	
			660					665					670		
		675					Met 680					685			
	690					695	Glu Ser				700				
705					710					715					720
ASN	rne	rne	GLU	725		111T	Ala	asp	730	TILE	т Лт	ıτÞ	₁23Þ	735	£25 C

Ser Glu Gly Gly Leu Lys Arg Ile Tyr Glu Lys Tyr Thr Trp Lys Leu 745 750 740 Tyr Ser Glu Arg Leu Met Thr Leu Thr Gly Val Tyr Gly Phe Trp Lys 760 Tyr Val Ser Asn Leu Glu Arg Arg Glu Thr Arg Arg Tyr Leu Glu Met 770 775 780 Phe Tyr Ala Leu Lys Tyr Arg Ser Leu Ala Ala Ala Val Pro Leu Ala 785 790 795 800 Val Asp Gly Glu Asn Thr Asp Asn 805 <210> 170 <211> 815 <212> PRT <213> Lolium perenne <400> 170 Met Gly Glu Ala Ala Gly Asp Arg Val Leu Ser Arg Leu His Ser Val 5 10 15 Arg Glu Arg Ile Gly Asp Ser Leu Ser Ala His Pro Asn Glu Leu Val 20 25 Ala Val Phe Thr Arg Leu Val Asn Leu Gly Lys Gly Met Leu Gln Pro 40 His Gln Ile Ile Ala Glu Tyr Asn Thr Ala Ile Pro Glu Ala Glu Arg 55 Glu Lys Leu Lys Asp Gly Ala Phe Glu Asp Val Leu Arg Ala Ala Gln 70 75 Glu Ala Ile Val Ile Ser Pro Trp Val Ala Leu Ala Ile Arg Pro Arg 85 90 95 Pro Gly Val Trp Glu Tyr Val Arg Val Asn Val Ser Glu Leu Ala Val 100 105 110 Glu Glu Leu Ser Val Pro Glu Tyr Leu Gln Phe Lys Glu Gln Leu Val 115 $1\overline{20}$ 125 Glu Gly Ser Asn Lys Asp Phe Val Leu Glu Leu Asp Phe Glu Pro Phe 130 135 140 Asn Ala Ser Phe Pro Arg Pro Ser Leu Ser Lys Ser Ile Gly Asn Gly 145 150 155 Val Gln Phe Leu Asn Arg His Leu Ser Ser Lys Leu Phe His Asp Lys 165 170 175 Glu Ser Met Tyr Pro Leu Leu Asn Phe Leu Arg Ala His Asn Tyr Lys 180 185 190 Gly Met Pro Met Met Met Asn Asp Arg Val Arg Ser Leu Ser Ala Leu 195 200 Gln Gly Ala Leu Arg Lys Ala Glu Glu His Leu Ser Gly Leu Pro Ala 210 215 220 Asp Thr Pro Tyr Ser Asp Phe His His Arg Phe Gln Glu Leu Gly Leu 235 225 230 Glu Lys Gly Trp Gly Asp Cys Ala Lys Arg Ala Gln Glu Thr Leu His 250 255 245 Leu Leu Leu Asp Leu Leu Glu Ala Pro Asp Pro Ser Thr Leu Glu Lys 260 265 270 Phe Leu Gly Thr Ile Pro Met Val Phe Asn Val Val Ile Leu Ser Pro 275 280 His Gly Tyr Phe Ala Gln Ala Asn Val Leu Gly Tyr Pro Asp Thr Gly 290 295 300 Gly Gln Val Val Tyr Ile Leu Asp Gln Val Arg Ala Met Glu Asn Glu 315 320 310 Met Leu Leu Arg Ile Lys Gln Gln Gly Leu Asp Ile Thr Pro Arg Ile 325 335 330 Leu Ile Val Thr Arg Leu Leu Pro Asp Ala Thr Gly Thr Thr Cys Gly 340 345 350 Gln Arg Leu Glu Lys Val Leu Gly Thr Glu His Thr His Ile Leu Arg 360 355 365 Val Pro Phe Arg Thr Glu Asn Gly Ile Val Arg Lys Trp Ile Ser Arg 370 375 380

Phe Glu Val Trp Pro Tyr Leu Glu Thr Phe Thr Asp Asp Val Ala His

140

385					390					395					400
Glu	Ile	Ser	Gly	Glu 405	Leu	Gln	Ala	Asn	Pro 410	Asp	Leu	Ile	Ile	Gly 415	Asn
Tyr	Ser	Asp	Gly 420	Asn	Leu	Val	Ala	Cys 425	Leu	Leu	Ala	His	Lys 430	Met	Gly
Val	Thr	His 435		Thr	Ile	Ala	His 440	Ala	Leu	Glu	Lys	Thr 445	Lys	Tyr	Pro
Asn	Ser 450		Leu	Tyr	Trp	Lys 455		Phe	Glu	Asp	His 460	Tyr	His	Phe	Ser
Cys 465		Phe	Thr	Thr	Asp 470		Ile	Ala	Met	Asn 475		Ala	Asp	Phe	Ile 480
	Thr	Ser	Thr	Phe 485	Gln	Glu	Ile	Ala	Gly 490	Asn	Lys	Asp	Thr	Val 495	Gly
Gln	Tyr	Glu	Ser 500	His	Met	Ala	Phe	Thr 505	Met	Pro	Gly	Met	Tyr 510	Arg	Val
Val	His	Gly 515	Ile	Asp	Val	Phe	Asp 520	Pro	Lys	Phe	Asn	Ile 525	Val	Ser	Pro
Gly	Ala 530	Asp	Met	Ser	Ile	Tyr 535	Phe	Pro	Tyr	Ser	Glu 540	Ser	Gln	Arg	Arg
545					Pro 550					555					560
_				565	Lys				570					575	
			580		Arg			585					590		
		595			Arg		600					605			
	610				Asp	615					620				
625					Lys 630					635					640
				645	Trp				650					655	
			660		Tyr			665					670		
		675	_		Ala		680					685			
	690				Phe	695					700				
705					Ser 710					715					720
_				725	Leu				730					735	
			740		Lys			745					750		
		755			Lys		760					765			
	770				Trp	775					780				
785					Glu 790					795					Met 800
Ala	Ser	Thr	Val	Pro 805	Leu	Ala	Val	Glu	Gly 810		Pro	Ser	Ser	Lys 815	
<21	0> 1	71													
	1> 5														

<211> 581 <212> PRT

<400> 171

Met Ala Gln Ala Trp Ala Phe Phé Leu Leu Ala Leu Phe Ser Phe Ser 1 5 10 15 15 Ser Tyr Val Ser Arg Ile Phe Leu Cys Ser Arg Asn Gly Glu Gly Ser 20 25 30 Phe Leu Cys Ala Arg Ala Pro Glu Val Pro Ser Ile Ala Ser Asp Arg

<213> Festuca arundinacea

Tyr	Arg 50	Thr	Ala	Tyr	His	Phe 55	Gln	Pro	His	Lys	Asn 60	Trp	Met	Asn	Asp
Pro 65		Gly	Pro	Met	Tyr 70	Tyr	Asn	Gly	Ile	Tyr 75	His	Leu	Phe	Phe	Gln 80
				85					90					His 95	
			100					105					110	Ile	
		115					120					125		Ala	
	130					135					140			Asp	
145					150					155				Ser	160
	_			165					170					Leu 175	
			180					185					190	Thr	
		195					200					205		Ala	
	210					215					220			Phe	
225	-		-		230				_	235				Ser	240
				245					250					Asn 255	
			260					265					270	Val	
		275					280					285		Tyr	
	290					295					300			Arg	
305					310					315				Ser Asn	320
				325					330					335 Ile	
			340					345					350	Leu	
		355					360					365		Ile	
	370					375					380			Lys	
385		_			390		_	-		395				Thr	400
				405					410					415 Pro	
			420					425					430	Gly	
		435					440					445		Thr	
	450					455					460			Leu	
465					470					475				Ala	480
				485					490					495 Lys	
			500					505					510		
		515					520					525		Ile	
_	530	_		_		535		_			540			Thr	
545	-	2			550		-			555		_			560

Val Arg Val Pro Gln Ile Arg Ala Trp Ser Met Met Thr Ala Gln Val 570 565 Asn Leu Lys Lys Gly 580 <210> 172 <211> 562 <212> PRT <213> Lolium perenne <400> 172 Met Asn Gly Ile Glu His Pro Gly Asn Gly Arg Thr Ala Tyr His Phe 1.0 Gln Pro Ala Lys His Trp Gln Asn Asp Pro Asn Gly Pro Met Tyr His 20 25 Asn Gly Leu Tyr His Phe Phe Tyr Gln Tyr Asn Pro His Gly Pro Thr 40 Trp Asp Thr Gly Lys Leu Ser Trp Gly His Ser Val Ser Gly Asp Leu 55 Val Asn Trp Ala Ala Leu Asp Asn Ala Leu Asp Pro Thr Ala Pro Phe 70 75 Asp Ala Asn Gly Cys Trp Ser Gly Ser Ala Thr Ile Leu Pro Gly Gly 85 90 95 Arg Pro Ala Ile Leu Tyr Thr Gly Ile Asp Ala Asp Lys Val Gln Val 105 110 Gln Asn Val Ala Phe Ala Lys Asp Pro Ser Asp Pro Leu Leu Arg Glu 120 125 Trp Glu Lys Pro Ser Cys Asn Pro Val Ile Pro Tyr Pro Ala Asp Val 130 135 140 Thr Gly Asn Asn Phe Arg Asp Pro Thr Glu Ala Trp Arg Gly Arg Asp 150 155 Gly Leu Trp Arg Val Gly Ile Val Ala Glu Val Lys Gly Val Gly Ser 165 170 175 Leu Leu Val Tyr Arg Ser Ala Asp Phe Leu Arg Trp Gln Arg Asn Ala 185 Ala Pro Leu His Ala Ser Ser Arg Asp Val Pro Val Leu Glu Cys Pro 195 200 Asp Leu Phe Pro Val Ala Ala Ala Ala Gln Gly Ala Thr Glu Gly Leu 210 215 220 Glu Thr Ser Ala Pro Ser Gly Ala Gly Val Arg His Val Leu Lys Leu 225 230 235 240 Thr Asp Phe Ala Lys Glu Asp His Tyr Met Val Gly Phe Tyr Asp Asp 245 250 255 Val Ala Asp Thr Phe Val Pro Ala Glu Pro Glu Arg Gly Asp Asp Pro 265 Asp Asn Trp Arg Arg Leu Asp His Gly His Leu Tyr Ala Ser Lys Ser 280 275 Phe Tyr Asp Ala Arg Asn Lys Arg Arg Ile Leu Trp Ala Trp Val Asp 300 290 295 Glu Thr Asp Gly Gly Gly Val Ala Arg Gly Trp Ala Gly Ile Gln Ala 310 315 320 Phe Pro Arg Ala Met Trp Leu Asp Ala Asp Gly Lys Arg Leu Val Gln 330 325 Trp Pro Val Glu Glu Ile Glu Thr Leu Arg Arg Lys Arg Val Gly Leu 345 Arg Trp Ala Thr Asp Val Glu Ala Gly Gly Arg Lys Glu Ile Ala Gly 355 360 365 Ile Val Ser Ser Gln Ala Asp Val Glu Val Val Phe Glu Ile Pro Asn 380 375 Leu Glu Glu Ala Glu Thr Leu Asp Pro Glu Trp Val Leu Asp Pro Lys 395 390 Gly Leu Cys Ala Ala Lys Gly Ala Ser Val His Gly Gly Val Gly Pro Phe Gly Leu Leu Val Leu Ala Ser Gly Asp Leu Glu Glu His Thr Ala 420 425

Val Phe Phe Arg Val Phe Lys His Asp Gly Lys Tyr Lys Val Leu Met

```
440
Cys Thr Asp Leu Thr Lys Ser Ser Thr Lys Ala Gly Ala His Lys Pro
 450 455
Ser Tyr Gly Ala Phe Leu Asp Val Asp Val Glu Lys Asp Lys Phe Ile
     470
                            475
Ser Leu Arg Thr Leu Ile Asp His Thr Val Val Glu Ser Phe Gly Asp
                   490 495
            485
Gly Gly Arg Thr Cys Met Thr Ala Arg Val Tyr Pro Glu His Ala Ala
       500 505 510
Met Gly Ser Thr His Leu Tyr Val Phe Asn Asn Gly Thr Gly Ala Val
     515 520
Lys Val Ser Lys Leu Glu Ala Trp Glu Leu Ala Thr Ala Ala Val Asn
 530 535 540
Gly Gly Ser Leu Ala Pro Val Val Val Lys Ala Ser Asp Pro Lys Glu
                     555 560
545 550
Ala Leu
<210> 173
<211> 580
<212> PRT
<213> Festuca arundinacea
<400> 173
Met Ala His Ala Trp Ala Phe Phe Leu Leu Ala Leu Phe Ser Phe Ser
1 5
                          10
Ser Cys Val Ser Lys Leu Phe Ile Tyr Ser Arg Asn Gly Glu Gly Ser
                     25
        2.0
Phe Leu Cys Thr Arg Ser Pro Glu Val Pro Ser Ile Ala Ser Lys Arg
                            4.5
            40
Tyr Arg Thr Ala Tyr His Phe Gln Ser Pro Lys Asn Trp Ile Asn Asp
                55
Pro Cys Gly Pro Met Tyr Tyr Asn Gly Ile Tyr His Glu Phe Tyr Gln
          70
                            75
Tyr Asn Pro Gly Gly Thr Ile Ala Ala Asn Ile Val Trp Gly His Ser
                           90
           85
Val Ser Thr Asp Leu Val Asn Trp Ile Gln Leu Glu Pro Ala Ile Val
         100
                        105 110
Arg Asp Thr Pro Tyr Asp Ile His Gly Cys Trp Thr Gly Ser Ile Thr
                            125
 115 120
Ile Leu Pro Gly Asp Gln Pro Val Ile Ile Tyr Thr Gly Arg Asp Ser
 130 135
Asp Asn His Gln Ser Gln Asn Ile Glu Leu Pro Lys Asn Arg Ser Asp
145 150 155
Pro Tyr Leu Arg Glu Trp Thr Lys Ala Asp Asn Asn Pro Arg Ile Leu
           165 170 175
Pro Val Gly Pro Asp Leu Asn Leu Thr Gln Phe Arg Asp Pro Thr Thr
                        185
                                       190
         180
Gly Trp Ile Gly Pro Asp Gly Leu Trp Arg Ile Ala Ile Gly Ala Glu
 195 200 205
Leu Asn Gly Tyr Gly Ala Ala Leu Leu Tyr Lys Ser Glu Asp Phe Leu
 210 215 220
Asn Trp Thr Arq Val Asp His Pro Leu Tyr Ser Asp Asn Ala Pro Ser
225 230 235 240
Met Trp Glu Cys Pro Asp Phe Phe Ala Val Leu Pro Gly Asn Asn Gly
                            250
           245
Gly Leu Asp Leu Ser Ala Ala Ile Pro Lys Gly Ala Lys His Val Leu
                        265
                                       270
         260
Lys Met Ser Val Asp Tyr Ser Asp Lys Tyr Met Ile Gly Val Tyr Asp
 275 - 280
Leu Lys Arg Asp Ala Phe Val Pro Asp Val Val Leu Asp Asp Arg Arg
                                  300
 290 295
Leu Trp Leu Arg Ile Asp Tyr Gly Thr Phe Tyr Ala Ser Lys Ser Phe 305 310 315 320
Phe Asp Ser Lys Arg Gly Arg Arg Val Ile Trp Gly Trp Ser Asn Glu
```

PCT/NZ02/00239

Thr Asp Ser Val Ser Asp Asp Gly Ala Lys Gly Trp Ala Gly Ile His 345 350 Ala Ile Pro Arg Ser Ile Trp Leu Asp Ser Asp Gly Lys Gln Leu Leu 360 365 Gln Trp Pro Ile Asp Glu Ile Glu Ser Leu Arg Arg Asp Glu Ile Asn 370 375 380 His Gln Gly Leu Glu Leu Lys Asn Gly Asp Leu Phe Glu Ile Lys Gly 390 395 400 Ile Asp Thr Leu Gln Ala Asp Ile Glu Val Asp Phe Glu Leu Thr Ser 405 410 415 Ile Asp Ser Ala Asp Pro Phe Asp Pro Ser Trp Leu Leu Asp Val Glu
420 425 430 Arg His Cys Arg Glu Ala Gly Ala Ser Val Gln Gly Gly Ile Gly Pro 435 440 445 Phe Gly Leu Val Val Leu Ala Ser Asp Asn Met Glu Glu His Ile Ala 455 460 Val'His Phe Arg Val Tyr Lys Ser Gln Lys Ser His Met Ile Leu Met 470 475 480 Cys Ser Asp Leu Arg Arg Ser Ser Leu Arg Ser Gly Leu Tyr Thr Pro 485 490 495 Ala Tyr Gly Gly Phe Phe Glu Phe Asp Leu Glu Lys Glu Arg Lys Ile 500 505 510 Ser Leu Arg Thr Leu Ile Asp Arg Ser Ala Val Glu Ser Phe Gly Gly 515 520 525 Gly Gly Arg Val Cys Ile Thr Ala Arg Ile Tyr Pro Val Ala Leu Val 535 540 Asp Gly Arg Val His Met Tyr Ala Phe Asn Asn Gly Ser Thr Thr Val 550 555 Arg Val Pro Gln Leu Gly Ala Trp Ser Met Met Thr Ala Gln Val Asn 565 Val Asn Lys Gly . 580 <210> 174 <211> 569 <213> Festuca arundinacea Lolium perenne <400> 174 Met Ala Gln Gly Trp Pro Phe Phe Leu Leu Val Leu Phe Ser Ser Cys 10 15 Val Ser Asn His Leu Val Asn Gly Glu Arg Val Phe Leu Phe Pro Gln 25 Ser His Lys Val Ser Ser Ile Val Ser Lys Arg Tyr Arg Thr Ala Tyr 3.5 4.0 His Phe Gln Pro Pro Lys Asn Trp Ile Asn Gly Pro Met Tyr Tyr Asn 60 55 Gly Ile Tyr His Glu Phe Tyr Gln Tyr Asn Pro Asn Gly Ser Leu Trp 70 75 Gly Asn Ile Ile Trp Gly His Ser Val Ser Thr Asp Leu Ile Asn Trp 90 95 Ile Pro Val Glu Pro Ala Ile Glu Arg Asp Ile Pro Ser Asp Ile Asn 100 105 110 Gly Cys Trp Thr Gly Ser Ala Thr Ile Ile Ser Gly Asp Gln Pro Ile 120 125 115 Ile Ile Tyr Thr Gly Ala Asp Lys Glu Asn Arg Gln Leu Gln Asn Ile 135 140 Val Leu Pro Lys Asn Lys Ser Asp Pro Tyr Leu Arg Glu Trp Thr Lys 150 155 Ala Gly Asn Asn Pro Val Ile Gln Pro Val Gly Pro Gly Leu Asn Ala 165 170 175 Ser Gln Phe Arg Asp Pro Thr Thr Gly Trp Ile Gly Pro Asp Gly Leu 180 185 190 Trp Arg Ile Ala Val Gly Ala Glu Leu Asn Gly Tyr Gly Ala Ala Leu 195 200 205

Leu Tyr Lys Ser Gln Asp Phe Leu Asn Trp Thr Arg Val Asp His Pro

```
215
Leu Tyr Ser Ser Asn Ala Ser Ser Met Trp Glu Cys Pro Asp Phe Phe
     230 235
Ala Val Leu Pro Gly Asn Ser Gly Gly Leu Asp Leu Ser Ala Glu Ile
           245 250 255
Pro Asn Gly Ala Lys His Val Leu Lys Met Ser Leu Asp Ser Cys Asp
                     265
                               270
Lys Tyr Met Ile Gly Val Tyr Asp Leu Lys Ser Asp Thr Phe Met Pro
 275 280 285
Asp Ser Val Leu Asp Asp Arg Arg Leu Trp Ser Arg Ile Asp His Gly
 290 295 300
Asn Phe Tyr Ala Ser Lys Ser Phe Phe Asp Ser Lys Lys Gly Arg Arg
305 310 315 320
Ile Ile Trp Gly Trp Thr Asn Glu Thr Asp Ser Ser Ser Asp Asp Val
          325
                          330 335
Ala Lys Gly Trp Ala Gly Ile His Ala Ile Pro Arg Thr Ile Trp Leu
         340
                       345
Asp Ser Tyr Gly Lys Gln Leu Leu Gln Trp Pro Ile Glu Glu Ile Glu
 355 360 365
Ser Leu Arg Arg Asn Glu Ile Ser His Gln Gly Leu Glu Leu Lys Lys
 370 375 380
Gly Asp Leu Phe Glu Ile Lys Gly Thr Asp Thr Ser Gln Ala Asp Val
      390 395
Glu Val Asp Phe Glu Leu Thr Ser Ile Asp Asn Ala Asp Pro Phe Asp
                          410
Pro Ser Trp Leu Leu Asp Val Glu Lys Gln Cys Arg Glu Ala Gly Ala
                        425
        420
Ser Val Gln Gly Gly Ile Gly Pro Phe Gly Leu Val Val Leu Ala Ser
 435 440 445
Asp Asn Met Glu Glu His Thr Ala Val His Phe Arg Val Tyr Lys Ser
 450 455 460
Gln Gln Ser Tyr Met Ile Leu Met Cys Ser Asp Leu Arg Arg Ser Ser
                            475
            470
Leu Arg Ser Gly Met Tyr Thr Pro Ala Tyr Gly Gly Phe Phe Glu Phe
         485
                         490
Asp Leu Gln Lys Glu Arg Lys Ile Ser Leu Arg Thr Leu Ile Asp Arg
      500 505 510
Ser Ala Val Glu Ser Phe Gly Gly Gly Gly Arg Val Cys Ile Met Ala
 515 520 525
Arg Val Tyr Pro Val Val Leu Val Asp Asp Gly Gly Ala His Met Tyr
 530 535 540
Ala Phe Asn Asn Gly Ser Thr Thr Val Arg Val Pro Gln Leu Arg Ala
                             555
545 . 550
Trp Ser Met Ser Arg Ala Glu His Lys
            565
<210> 175
<211> 588
<212> PRT
<213> Lolium perenne
<400> 175
Met Gly Val Arg Leu Gly Arg Val Ala Trp Ala Cys Pro Ala Val Leu
            5
                     10
Val Leu Leu Leu Gln Leu Ala Gly Ala Ser His Val Val Tyr Glu Thr
                        25
Ser Leu Leu Glu Thr Glu Ala Ala Ala Ala Thr Val Pro Ala Ser Ile
 35
                     40
Phe Glu Leu Ser Thr Gly Tyr His Phe Arg Pro Gln Lys Asn Trp Ile
                  55
                                 60
Asn Asp Pro Asn Ala Pro Leu Tyr Tyr Lys Gly Trp Tyr His Leu Phe
             70
                            75
Phe Gln Tyr Asn Pro Lys Gly Ala Val Trp Gly Asn Ile Val Trp Ala
                  90
                                  95
His Ser Val Ser Arg Asp Leu Ile Asn Trp Val Ala Leu Glu Thr Ala
```

105

Leu	Ala	Pro 115	Ser	Ile	Asp	Ala	Asp 120	Lys	Tyr	Gly	Cys	Trp 125	Ser	Gly	Ser
Ala	Thr 130	Ile	Met	Pro	Asp	Gly 135	Thr	Pro	Val	Ile	Met 140	Tyr	Thr	Gly	Val
Ser 145		Pro	Asp	Val	Asn 150	Tyr	Glu	Val	Gln	Asn 155	Val	Ala	Phe	Pro	Lys 160
	Ser	Ser	Asp	Pro 165		Leu	Arg	Glu	Trp 170		Lys	Pro	Ala	His 175	
Pro	Val	Ile	Val 180		Glu	Gly	Gly	Ile 185		Ala	Thr	Gln	Phe 190		Asp
Pro	Thr	Thr 195		Trp	Tyr	Ala	Asp 200		His	Trp	Arg	Ile 205		Val	Gly
Ala	Leu 210		Gly	Ala	Ser	Arg 215		Val	Ala	Tyr	Val 220		Arg	Ser	Arg
Asp 225		Arg	Arg	Trp	Thr 230	Arg	Val	Arg	Lys	Pro 235		His	Ser	Ala	Pro 240
	Gly	Met	Trp	Glu 245		Pro	Asp	Phe	Tyr 250		Val	Thr	Val	Asp 255	Gly
Lys	Glu	Ser	Gly 260		Asp	Thr	Ser	Val 265	Val	Ser	Ser	Ser	Arg 270	Val	Lys
His	Val	Leu 275	Lys	Asn	Ser	Leu	Asp 280	Leu	Arg	Arg	Tyr	Asp 285	Tyr	Tyr	Thr
Val	Gly 290	Thr	Tyr	Asp	Arg	Leu 295	Lys	Glu	Arg	Tyr	Val 300	Pro	Asp	Așn	Pro
Ala 305	Gly	Asp	Lys	His	His 310	Leu	Arg	Tyr	Asp	Tyr 315	Gly	Asn	Phe	Tyr	Ala 320
Ser	Lys	Thr	Phe	Tyr 325	Asp	Pro	Ser	Lys	Arg 330	Arg	Arg	Ile	Leu	Trp 335	Gly
Trp	Ala	Asn	Glu 340	Ser	Asp	Thr	Ala	Val 345	Asp	Asp	Val	Ala	Lys 350	Gly	Trp
Ala	Gly	Ile 355	Gln	Ala	Ile	Pro	Arg 360	Lys	Val	Trp	Leu	Asp 365	Pro	Ser	Gly
Arg	Gln 370	Leu	Met	Gln	Trp	Pro 375	Val	Glu	Glu	Val	Glu 380	Ala	Leu	Arg	Gly
385					390	Lys				395					400
Val	Glu	Val	Thr	Gly 405	Leu	Gln	Thr	Ala	Gln 410		Asp	Val	Glu	Val 415	Ser
Phe	Glu	Val	Pro 420	Ser	Leu	Glu	Gly	Ala 425	Glu	Ala	Leu	Asp	Pro 430	Ala	Leu
Ala	Asn	Asp 435	Ala	Gln	Lys	Leu	Cys 440	Gly	Val	Lys	Gly	Ala 445	Asp	Val	Glu
Gly	Gly 450	Val	Gly	Pro	Phe	Gly 455	Leu	Trp	Val	Leu	Ala 460	Ser	Ser	Lys	Leu
465		_			470	Phe		_		475	_				480
				485		Leu			490					495	
			500			Leu		505					510		
		515				Gly	520					525			
	530					Phe 535					540				
545					550	Leu				555					560
Val	Phe	Asn	Asn	Gly 565	Lys	Ala	Asp	Ile	Lуs 570	Val	Ser	Arg	Leu	Thr 575	Ala
Trp	Glu	Met	Lys 580	Lys	Pro	Ala	Leu	Met 585	Asn	Gly	Ala				

<210> 176

<211> 670 <212> PRT <213> Lolium perenne

<400> 176 Met Pro Met Glu Ala Arg Asp Gly Val Ser Met Pro Tyr Ser Tyr Ala 1 5 10 Ala Leu Pro Glu Asp Ala Glu Ala Ala Val Val Gly Arg Gly Arg Arg 20 25 Thr Gly Pro Leu Phe Ala Ala Leu Leu Leu Thr Leu Val Ala Ala Leu 35 40 4.5 Leu Ala Val Ala Ala Leu Ala Gly Val Arg Leu Val Gly Glu Leu Pro 55 Ala Gly Gly Val Val Met Pro Asn His Pro Met Glu Val Met Asp Val 70 75 Ser Gly Ser Arg Gly Pro Glu Ser Gly Val Ser Glu Lys Thr Ser Gly 85 90 95 Ala Ala Ser Glu Ser Gly Gly Met Leu Gly Ala Asp Ala Gly Ser Asn 105 110 100 Ala Phe Pro Trp Ser Asn Ala Met Leu Gln Trp Gln Arg Thr Gly Phe 120 His Phe Gln Pro Glu Lys Asn Trp Met Asn Asp Pro Asn Gly Pro Val 130 135 140 Tyr Tyr Lys Gly Trp Tyr His Leu Phe Tyr Gln Tyr Asn Pro Glu Gly 145 150 155 160 Ala Ile Trp Gly Asn Lys Ile Ala Trp Gly His Ala Val Ser Arg Asp 165 170 175 Met Leu Arg Trp Arg His Leu Pro Ile Ala Met Phe Pro Asp Gln Trp 180 185 190 Tyr Asp Ile Asn Gly Ala Trp Ser Gly Ser Ala Thr Val Leu Pro Asp 195 200 205 Gly Arg Ile Val Met Leu Tyr Thr Gly Ser Thr Asn Ala Ser Val Gln 210 215 220 Val Gln Cys Leu Ala Phe Pro Ser Asp Pro Ser Asp Pro Leu Leu Thr 230 235 240 Asn Trp Thr Lys Tyr Glu Gly Asn Pro Val Leu Tyr Pro Pro Pro His 245 250 255 Val Gly Glu Lys Asp Phe Arg Asp Pro Thr Thr Ala Trp Tyr Asp Gly 265 270 260 Ser Asp Gly Met Trp Arg Ile Val Ile Gly Ser Lys Asp Asn Arg Arg 280 275 285 Ala Gly Met Ala Leu Thr Tyr Lys Thr Lys Asn Phe His Asp Phe Glu 290 295 300 Leu Val Pro Gly Val Leu His Arg Val Pro Ala Thr Gly Met Trp Glu 305 310 315 320 Cys Ile Asp Leu Tyr Pro Val Gly Gly Ala Arg Gly Ile Asp Met Thr 330 325 Glu Ala Val Ala Ala Ser Asn Ser Gly Gly Gly Glu Val Leu His 340 345 Val Met Lys Glu Ser Ser Asp Asp Asp Arg His Asp Tyr Tyr Ala Leu 360 Gly Arg Tyr Asp Ala Ala Thr Asn Lys Trp Thr Pro Leu Asp Ala Asp 370 380 375 Ala Asp Val Gly Ile Gly Leu Arg Tyr Asp Trp Gly Lys Phe Tyr Ala 390 395 Ser Lys Thr Phe Tyr Asp Pro Ala Lys Lys Arg Arg Val Leu Trp Gly 415 405 410 Trp Val Gly Glu Thr Asp Ser Glu Arg Ala Asp Val Ala Lys Gly Trp 420 425 Ala Ser Leu Gln Ser Ile Pro Arg Thr Val Val Leu Asp Thr Lys Thr 445 435 440 Gly Ser Asn Leu Ile Gln Trp Pro Val Val Glu Val Glu Thr Leu Arg 455 460 Thr Asn Ser Thr Asn Leu Gly Ser Ile Ile Val Glu His Gly Ser Val 465 470 475 Phe Pro Leu Ser Leu His Arg Ala Thr Gln Leu Asp Ile Glu Ala Ser 485 490 Phe Arg Leu Asp Pro Leu Asp Val Ala Ala Ala Lys Glu Ala Asp Val 500 505 510 Gly Tyr Asn Cys Ser Thr Ser Gly Gly Ala Ala Gly Arg Gly Ala Leu

```
520
      515
Gly Pro Phe Gly Leu Leu Val Leu Ala Asp Ala Arg Arg His Gly Gly
 530 535 540
Asp Thr Glu Gln Thr Ala Val Tyr Phe Tyr Val Ala Arg Gly Leu Asp
545 550 555
Gly Asn Leu Arg Thr His Phe Cys His Asp Glu Ser Arg Ser Ser Arg
                                   575
            565
                           570
Ala Asn Asp Ile Val Lys Arg Val Val Gly Asn Ile Val Pro Val Leu
                       585 590
        580
Asp Gly Glu Ala Leu Ser Val Arg Val Leu Val Asp His Ser Ile Val 595 600 605
 595 600
Glu Ser Phe Ala Gln Gly Gly Arg Ser Val Val Thr Ser Arg Val Tyr
 610 615 620
Pro Thr Glu Ala Ile Tyr Ala Asn Ala Gly Val Tyr Leu Phe Asn Asn
625 630 635
Ala Thr Gly Ala Arg Val Thr Ala Thr Ser Leu Val Val His Glu Met
                   650 655
Asp Pro Ser Tyr Asn Gln Asn Gln Ala Glu Met Ala Ser Leu
 660 665 670
<210> 177
<211> 514
<212> PRT
<213> Lolium perenne
<400> 177
Met His Ala Asp Pro Asn Gly Pro Val Tyr Tyr Arg Gly Trp Tyr His 1 \phantom{0} 5 \phantom{0} 10 \phantom{0} 15
1 5
Leu Phe Tyr Gln Tyr Asn Pro Glu Gly Ala Val Trp Gly Asn Ile Ala
Trp Gly His Ala Val Ser Arg Asp Leu Val His Trp Arg His Leu Pro
35 40
Leu Ala Met Val Pro Asp Gln Trp Tyr Asp Ile Asn Gly Val Trp Thr
50 55
Gly Ser Ala Thr Val Phe Pro Asp Gly Thr Leu Asn Met Leu Tyr Thr
            70
                             75
Gly Ser Thr Asn Ala Ser Val Gln Ala Gln Cys Leu Ala Val Pro Glu
                             90
          85
Asp Pro Asn Asp Ser Leu Leu Arg Asn Trp Thr Lys His Glu Ala Asn
 100 105 110
Pro Val Leu Leu Pro Pro Pro Gly Ile Gly Asp Lys Asp Phe Arg Asp 115 120 125
Pro Thr Thr Ala Trp Phe Asp Glu Ser Asp Gln Thr Trp Arg Thr Val
   130 135 140
Ile Gly Ser Lys Asp Asn Asn Gly His Ala Gly Ile Ala Met Val Tyr
                               155 160
               150
Lys Thr Lys Asp Phe Leu Asn Tyr Glu Leu Ile Pro Gly Tyr Leu His
                                            175
            165
                            170
Arg Val Asp Gly Thr Gly Met Trp Glu Cys Ile Asp Phe Tyr Pro Val
        180 185 190
Gly Gly Lys Asn Gly Ser Glu Glu Leu Tyr Val Ile Lys Glu Ser Ser
195 200 205
Asp Asp Arg His Asp Trp Tyr Thr Leu Gly Lys Tyr Asp Ala Ala
 210 215
                                   220
Ala Asn Thr Phe Thr Ala Ala Asp Pro Glu Asn Asp Leu Gly Ile Gly
225 230
                               235
Leu Arg Tyr Asp Trp Gly Lys Phe Tyr Ala Ser Lys Thr Phe Tyr Asp
                             250 255
            245
Pro Ala Lys Lys Arg Arg Val Leu Trp Gly Trp Ile Gly Glu Thr Asp
                   265 270
       260
Ser Glu Arg Ala Asp Val Ala Lys Gly Trp Ala Ser Leu Met Ser Ile
275 280 285
Pro Arg Thr Val Glu Leu Asp Glu Lys Thr Trp Thr Asn Leu Ile Gln 290 295 300
          295
Trp Pro Val Glu Glu Ile Glu Thr Leu Arg Ile Lys Ser Thr Asp Leu
```

Gly Gly Ile Thr Ile Asp His Gly Ser Val Tyr Pro Leu Pro Leu His 330 325 Arg Ala Thr Gln Leu Asp Ile Glu Ala Ser Phe Arg Leu Asp Ala Ala 345 350 Thr Val Ala Ala Leu Asn Glu Ala Asp Val Gly Tyr Asn Cys Ser Thr 365 360 Ser Gly Gly Ser Thr His Arg Gly Ala Leu Gly Pro Phe Gly Ile Leu 370 375 Val Leu Ala Asp Gly Lys Ala Glu Gln Thr Ala Val Tyr Phe Tyr Val 385 390 395 Ser Lys Gly Leu Asp Gly Ala Leu Glu Thr His Phe Cys His Asp Glu 405 410 415 Ser Arg Ser Thr Leu Ala Lys Asp Val Val Lys Arg Val Val Gly Tyr 425 430 Thr Val Pro Val Leu Asp Gly Glu Ala Phe Ser Val Arg Val Leu Val 445 440 435 Asp His Ser Ile Val Glu Ser Phe Ala Met Gly Gly Arg Ser Thr Ala 455 460 Thr Ser Arg Val Tyr Pro Thr Glu Ser Ile Tyr Gly Ala Ala Gly Ala 465 470 475 Tyr Leu Phe Asn Asn Ala Thr Gly Gly Ser Val Thr Val Glu Lys Leu 485 490 495 Val Val His Glu Met Asp Ser Ser Tyr Asn Gln Ile Phe Met Ala Asp 505 Asp Leu <210> 178 <211> 557 <212> PRT <213> Lolium perenne Met Gly Ser Val Pro Glu Glu Ser Val Val Ser Val Ala Ala Glu 10 1 Thr Val Phe Arg Ser Lys Leu Pro Asp Ile Glu Ile Asn Asn Glu Gln 20 25 Thr Leu Gln Ser Tyr Cys Phe Glu Lys Met Ala Glu Val Ala Ser Arg 35 40 45 Pro Cys Ile Ile Asp Gly Gln Thr Gly Ala Ser Tyr Thr Tyr Thr Glu 55 60 Val Asp Ser Leu Thr Arg Arg Ala Ala Ala Gly Leu Arg Arg Met Gly 65 70 75 80 70 Val Gly Lys Gly Asp Val Val Met Asn Leu Leu Arg Asn Cys Pro Glu 90 Phe Ala Phe Ser Phe Leu Gly Ala Ala Arg Leu Gly Ala Ala Thr Thr 100 110 105 Thr Ala Asn Pro Phe Tyr Thr Pro His Glu Ile His Arg Gln Ala Glu 115 120 125

Ala Ala Gly Ala Lys Leu Ile Val Thr Glu Ala Cys Ala Val Glu Lys 130 135 140 Val Leu Glu Phe Ala Ala Gly Arg Gly Leu Pro Val Val Thr Val Asp 155 150 Gly Arg Arg Asp Gly Cys Val Asp Phe Ala Glu Leu Ile Ala Gly Glu 175 165 170 Glu Leu Pro Glu Ala Asp Glu Ala Gly Ile Leu Pro Asp Asp Val Val 180 190 185 Ala Leu Pro Tyr Ser Ser Gly Thr Thr Gly Leu Pro Lys Gly Val Met 205 200 Leu Thr His Arg Ser Leu Val Thr Ser Val Ala Gln Leu Val Asp Gly 210 215 220 Ser Asn Pro Asn Val Cys Phe Asn Lys Asp Asp Ala Leu Leu Cys Leu 225 230 235 240 Leu Pro Leu Phe His Ile Tyr Ser Leu His Thr Val Leu Leu Ala Gly 245 250 Leu Arg Val Gly Ala Ala Ile Val Ile Met Arg Lys Phe Asp Val Gly

265 260 Ala Leu Val Asp Leu Val Arg Ala His Arg Ile Thr Ile Ala Pro Phe 275 280 285 Val Pro Pro Ile Val Val Glu Ile Ala Lys Ser Asp Arg Val Gly Ala 300 290 · 295 Asp Asp Leu Ala Ser Ile Arg Met Val Leu Ser Gly Ala Ala Pro Met 310 315 Gly Lys Asp Leu Gln Asp Ala Phe Met Ala Lys Ile Pro Asn Ala Val 325 330 335 Leu Gly Gln Gly Tyr Gly Met Thr Glu Ala Gly Pro Val Leu Ala Met 340 345 350 Cys Leu Ala Phe Ala Lys Glu Pro Phe Lys Val Lys Ser Gly Ser Cys 355 360 365 Gly Thr Val Val Arg Asn Ala Glu Leu Lys Val Val Asp Pro Asp Thr 380 375 Gly Ala Ser Leu Gly Arg Asn Gln Pro Gly Glu Ile Cys Val Arg Gly 390 395 Lys Gln Ile Met Ile Gly Tyr Leu Asn Asp Pro Glu Ser Thr Lys Asn 405 410 415 Thr Ile Asp Lys Asp Gly Trp Leu His Thr Gly Asp Ile Gly Leu Val 420 425 430 Asp Asp Asp Glu Ile Phe Ile Val Asp Arg Leu Lys Glu Ile Ile 440 445 Lys Tyr Lys Gly Phe Gln Val Ala Pro Ala Glu Leu Glu Ala Leu Leu 455 460 Leu Thr Asn Pro Glu Val Lys Asp Ala Ala Val Val Gly Val Lys Asp 465 470 475 Asp Leu Cys Gly Glu Val Pro Val Ala Phe Ile Lys Arg Ile Glu Gly 485 490 495 Ser Glu Ile Thr Glu Asn Glu Ile Lys Gln Phe Val Ser Lys Glu Val 500 505 510 Val Phe Tyr Lys Arg Ile Asn Lys Val Tyr Phe Thr Asp Ser Ile Pro 520 525 Lys Asn Pro Ser Gly Lys Ile Leu Arg Lys Asp Leu Arg Ala Arg Leu 535 540 Ala Ala Gly Ile Pro Thr Glu Val Ala Ala Pro Arg Ser 550 <210> 179 <211> 501 <212> PRT <213> Lolium perenne <400> 179 Met Glu Val Leu Leu Glu Lys Ala Leu Leu Gly Leu Phe Ala Ala 10 Ala Val Leu Ala Ile Ala Val Ala Lys Leu Ala Gly Lys Arg Phe Arg 25 Leu Pro Pro Gly Pro Ser Gly Ala Pro Ile Val Gly Asn Trp Leu Gln 35 40 Val Gly Asp Asp Leu Asn His Arg Asn Leu Met Gly Ile Ala Lys Arg 50 55 60 Phe Gly Glu Val Phe Leu Leu Arg Met Gly Ile Arg Asn Leu Val Val 70 75 80 Val Ser Ser Pro Glu Leu Ala Lys Glu Val Leu His Thr Gln Gly Val 90 Glu Phe Gly Ser Arg Thr Arg Asn Val Val Phe Asp Ile Phe Thr Gly 100 105 110 Asn Gly Gln Asp Met Val Phe Thr Val Tyr Gly Asp His Trp Arg Lys 120 125 115 Met Arg Arg Ile Met Thr Val Pro Phe Phe Thr Asn Lys Val Val Ala 130 135 140 Gln Asn Arg Val Gly Trp Glu Glu Glu Ala Arg Leu Val Val Glu Asp 150 155 Val Lys Ala Asp Pro Ala Ser Ala Thr Ala Gly Thr Val Ile Arg Arg

Arg Leu Gln Leu Met Met Tyr Asn Asp Met Phe Arg Ile Met Phe Asp 185 Arg Arg Phe Glu Ser Val Asp Asp Pro Leu Phe Asn Lys Leu Lys Ala 195 200 205 Met Asn Ala Glu Arg Ser Ile Leu Ser Gln Ser Phe Asp Tyr Asn Tyr 210 215 220 Gly Asp Phe Ile Pro Ile Leu Arg Pro Phe Leu Arg Lys Tyr Leu Asn 235 240 230 Arg Cys Thr Asn Leu Lys Thr Lys Arg Met Lys Leu Phe Glu Asp His 245 250 255 Phe Val Ala Asp Arg Lys Lys Ala Leu Glu Gln Asn Gly Glu Ile Arg 260 265 Cys Ala Met Asp His Ile Leu Glu Ala Glu Arg Lys Gly Glu Ile Asn 275 280 285 His Asp Asn Val Leu Tyr Ile Val Glu Asn Ile Asn Val Ala Ala Ile 295 300 Glu Thr Thr Leu Trp Ser Ile Glu Trp Gly Ile Ala Glu Leu Val Asn 310 315 His Pro Asp Val Gln Ser Lys Leu Arg Asp Glu Met Thr Ala Val Leu 325 330 335 Gly Ala Asp Val Ala Val Thr Glu Pro Asp Leu Glu Arg Leu Pro Tyr 340 345 350 Leu Gln Ser Val Val Lys Glu Thr Leu Arg Leu Arg Met Ala Ile Pro 355 360 365 Leu Leu Val Pro His Met Asn Leu Ser Asp Ala Lys Leu Ala Gly Tyr 375 380 Asp Ile Pro Ala Glu Ser Lys Ile Leu Val Asn Ala Trp Phe Leu Ala 395 390 Asn Asp Pro Lys Arg Trp Val Arg Ala Asp Glu Phe Arg Pro Glu Arg 405 410 415 Phe Leu Glu Glu Lys Ala Val Glu Ala His Gly Asn Asp Phe Arg 420 425 430 Phe Val Pro Phe Gly Val Gly Arg Arg Ser Cys Pro Gly Ile Val Leu 435 440 445 Ala Leu Pro Ile Ile Gly Ile Thr Leu Gly Arg Leu Val Gln Asn Phe 460 -450 455 Gln Leu Leu Pro Pro Pro Gly Gln Asp Lys Ile Asp Thr Thr Glu Lys 465 470 475 Pro Gly Gln Phe Ser Asn Gln Ile Leu Lys His Ala Thr Val Val Cys 485 490 Lys Pro Leu Glu Ala 500

<210> 180

<211> 361

<212> PRT

<213> Lolium perenne

<400> 180

Met Gly Ser Val Asp Ala Ser Glu Lys Thr Ile Thr Gly Trp Ala Ala Arg Asp Ala Thr Gly His Leu Ser Pro Tyr Thr Tyr Asn Leu Arg Arg 25 20 Thr Gly Ala Glu Asp Val Val Leu Lys Val Leu Tyr Cys Gly Ile Cys 40 4.5 His Thr Asp Leu His Gln Thr Lys Asn His Leu Gly Ala Ser Lys Tyr 55 60 Pro Met Val Pro Gly His Glu Val Val Gly Glu Val Val Glu Val Gly 70 Pro Glu Val Ser Lys Tyr Ser Val Gly Asp Val Val Gly Val Gly Val 85 90 95 Ile Val Gly Cys Cys Arg Asp Cys Arg Pro Cys Lys Ala Asn Val Glu 100 105 110 Gln Tyr Cys Asn Lys Lys Ile Trp Ser Tyr Asn Asp Val Tyr Thr Asp 115 120 125 Gly Lys Pro Thr Gln Gly Gly Phe Ala Ser Ser Met Val Val Asp Gln

135 140 Lys Phe Val Val Lys Ile Pro Ala Gly Leu Ala Pro Glu Gln Ala Ala 145 150 155 Pro Leu Leu Cys Ala Gly Val Thr Val Tyr Ser Pro Leu Lys His Phe 170 165 Gly Leu Met Thr Pro Gly Leu Arg Gly Gly Ile Leu Gly Leu Gly Gly 180 185 190 Val Gly His Met Gly Val Lys Val Ala Lys Ser Met Gly His His Val 200 Thr Val Ile Ser Ser Ser Asp Lys Lys Arg Ala Glu Ala Met Asp Asp 210 215 220 Leu Gly Ala Asp Ala Tyr Leu Val Ser Ser Asp Glu Ala Gln Met Ala 230 235 240 Ala Ala Met Asp Ser Leu Asp Tyr Ile Ile Asp Thr Val Pro Val Lys 250 255 245 His Pro Leu Glu Pro Tyr Leu Ala Leu Leu Lys Met Asp Gly Lys Leu 265 Val Leu Met Gly Val Ile Gly Glu Pro Leu Ser Phe Val Ser Pro Met 275 280 285 Val Met Leu Gly Arg Lys Thr Ile Thr Gly Ser Phe Ile Gly Ser Ile 290 295 300 Glu Glu Thr Glu Glu Val Leu Arg Phe Cys Val Asp Lys Gly Leu Thr 305 310 315 320 Ser Gln Ile Glu Val Val Lys Met Asp Tyr Leu Asn Gln Ala Leu Glu 325 330 335 Arg Leu Glu Arg Asn Asp Val Arg Tyr Arg Phe Val Val Asp Val Ala 340 345 Gly Ser Asn Ile Asp Asp Thr Ala Ala 355 <210> 181 <211> 363 <212> PRT <213> Lolium perenne <400> 181 Met Thr Val Val Glu Val Leu Ala Ala Gly Asp Ala Ala Ala Ala Ala 10 Val Ala Arg Pro Ala Gly Asn Gly Gln Thr Val Cys Val Thr Gly Ala 20 25 Ala Gly Tyr Ile Ala Ser Trp Leu Val Lys Leu Leu Leu Glu Lys Gly 35 40 45 Tyr Thr Val Lys Gly Thr Val Arg Asn Pro Asp Asp Pro Lys Asn Ala 55 60 His Leu Arg Ala Leu Asp Gly Ala Ala Asp Arg Leu Val Leu Cys Lys 75 70 Ala Asp Leu Leu Asp Tyr Asp Ala Ile Arg Arg Ala Ile Asp Gly Cys 90 His Gly Val Phe His Thr Ala Ser Pro Val Thr Asp Asp Pro Glu Gln 100 105 Met Val Glu Pro Ala Val Arg Gly Thr Gln Tyr Val Ile Asp Ala Ala 115 120 125 Ala Glu Ala Gly Thr Val Arg Arg Met Val Leu Thr Ser Ser Ile Gly 130 135 140 Ala Val Thr Met Asp Pro Asn Arg Gly Pro Asp Val Val Asp Glu 155 Ser Cys Trp Ser Asp Leu Asp Phe Cys Lys Lys Thr Arg Asn Trp Tyr 165 170 175 Cys Tyr Gly Lys Ala Val Ala Glu Gln Ala Ala Ser Glu Leu Ala Arg 180 185 190 Gln Arg Gly Val Asp Leu Val Val Val Asn Pro Val Leu Val Ile Gly 195 200 205 Pro Leu Leu Gln Pro Thr Val Asn Ala Ser Ile Gly His Ile Leu Lys 210 215 220 Tyr Leu Asp Gly Ser Ala Ser Lys Phe Ala Asn Ala Val Gln Ala Tyr 235

Val Asp Val Arg Asp Val Ala Asp Ala His Leu Arg Val Phe Glu Cys 245 250 Ala Ala Ala Ser Gly Arg His Leu Cys Ala Glu Arg Val Leu His Arg 265 Glu Asp Val Val Arg Ile Leu Ala Lys Leu Phe Pro Glu Tyr Pro Val 275 280 285 Pro Thr Arg Cys Ser Asp Glu Ala Asn Pro Arg Lys Gln Pro Tyr Lys 295 300 Met Ser Asn Gln Lys Leu Gln Asp Leu Gly Leu Glu Phe Arg Pro Val 310 315 320 Ser Gln Ser Leu Tyr Glu Thr Val Lys Ser Leu Gln Glu Lys Gly His 325 330 335 Leu Pro Val Leu Ser Glu Gln Ala Glu Ala Asp Lys Glu Thr Leu Ala 340 345 Ala Glu Leu Gln Ala Gly Val Thr Ile Arg Ala <210> 182 <211> 360 <212> PRT <213> Festuca arundinacea <400> 182 Met Gly Ser Thr Ala Ala Asp Met Ala Ala Ser Ala Asp Glu Glu Ala Cys Met Phe Ala Leu Gln Leu Ala Ser Ser Ile Leu Pro Met Thr 20 25 Leu Lys Asn Ala Ile Glu Leu Gly Leu Leu Glu Ile Leu Val Ala Ala 4.5 35 40 Gly Gly Lys Ser Leu Thr Pro Thr Glu Val Ala Ala Lys Leu Pro Ser 55 60 Ala Ala Asn Pro Glu Ala Pro Asp Met Val Asp Arg Met Leu Arg Leu 75 Leu Ala Ser Tyr Asn Val Val Thr Cys Leu Val Glu Glu Gly Lys Asp 85 90 Gly Arg Leu Ser Arg Ser Tyr Gly Ala Ala Pro Val Cys Lys Phe Leu 105 100 Thr Pro Asn Glu Asp Gly Val Ser Met Ala Ala Leu Ala Leu Met Asn 115 120 125 Gln Asp Lys Val Leu Met Glu Ser Trp Tyr Tyr Leu Lys Asp Ala Val 130 . 135 140 Leu Asp Gly Gly Ile Pro Phe Asn Lys Ala Tyr Gly Met Ser Ala Phe 150 155 Glu Tyr His Gly Thr Asp Pro Arg Phe Asn Arg Val Phe Asn Glu Gly 165 170 Met Lys Asn His Ser Ile Ile Ile Thr Lys Lys Leu Leu Glu Leu Tyr 180 185 190 His Gly Phe Gln Gly Leu Gly Thr Leu Val Asp Val Gly Gly Val 195 200 205 Gly Ala Thr Val Ala Ala Ile Ala Ala His Tyr Pro Ala Ile Lys Gly 215 220 Val Asn Phe Asp Leu Pro His Val Ile Ser Glu Ala Pro Gln Phe Pro 230 235 Gly Val Thr His Val Gly Gly Asp Met Phe Lys Glu Val Pro Ser Gly 245 250 255 Asp Ala Ile Leu Met Lys Trp Ile Leu His Asp Trp Ser Asp Gln His 265 270 · 260 Cys Ala Thr Leu Leu Lys Asn Cys Tyr Asp Ala Leu Pro Ala His Gly 280 Lys Val Val Leu Val Glu Cys Ile Leu Pro Val Asn Pro Glu Ala Lys 295 300 Pro Ser Ser Gln Gly Val Phe His Val Asp Met Ile Met Leu Ala His 310 315 320 Asn Pro Gly Gly Arg Glu Arg Tyr Glu Arg Glu Phe Glu Ala Leu Ala

Arg Gly Ala Gly Phe Thr Gly Val Lys Ser Thr Tyr Ile Tyr Ala Asn 340 345 Ala Trp Ala Ile Glu Phe Thr Lys <210> 183 <211> 543 <212> PRT <213> Lolium perenne <400> 183 Met Val Gly Phe Ala Lys Ile Ala Met Glu Trp Ile Gln Asp Pro Leu 5 10 Ser Trp Leu Phe Ile Ala Ser Val Val Phe Val Val Leu Gln Arg Arg 25 Arg Arg Gly Asn Val Ala Pro Phe Pro Pro Gly Pro Lys Pro Leu Pro 35 40 Ile Val Gly Asn Met Ser Met Met Asp Gln Leu Thr His Arg Gly Leu 55 60 Ala Ala Leu Ala Lys Glu Tyr Gly Gly Leu Leu His Ile Arg Leu Gly 65 . 70 75 80 Lys Leu His Thr Phe Ala Val Ser Thr Pro Glu Tyr Ala Arg Glu Val 90 Leu Gln Val Gln Asp Gly Ala Phe Ser Asn Arg Pro Ala Thr Ile Ala 105 Ile Ala Tyr Leu Thr Tyr Asp Arg Ala Asp Met Ala Phe Ala His Tyr 120 125 115 Gly Pro Phe Trp Arg Gln Met Arg Lys Leu Cys Val Met Lys Leu Phe 130 135 140 Ser Arg Arg Pro Glu Thr Trp Leu Ala Val Arg Asp Glu Ser Ala 150 155 160 Ala Leu Val Arg Ala Val Ala Arg Arg Thr Gly Glu Ser Val Asp Leu 165 170 175 Gly Glu Leu Ile Phe Lys Leu Thr Lys Asn Val Ile Phe Arg Ala Ala 185 180 Phe Gly Ala Gly Ala Val Ala Ala Asp Ala Glu Glu Gly Asp Gly Ala 195 200 205 Gly Lys Gln Asp Glu Phe Ile Ala Ile Leu Gln Glu Phe Ser Lys Leu 210 215 220 Phe Gly Ala Phe Asn Ile Gly Asp Phe Ile Pro Trp Leu Ser Trp Ala 230 235 240 Asp Pro Gln Gly Ile Asn Val Arg Leu Arg Ala Ala Arg Asn Ala Leu 245 250 Asp Glu Phe Ile Asp Lys Ile Ile Asp Glu His Met Glu Arg Gly Lys 265 Asn Pro Asp Asp Ala Asp Ala Asp Met Val Asp Asp Met Leu Ala Phe 285 280 Leu Pro Glu Ala Lys Pro Lys Lys Gly Ala Ala Gly Asp Gly Val Asp 295 300 Asp Leu Gln Asn Thr Leu Arg Leu Thr Arg Asp Asn Ile Lys Ala Ile 310 315 Ile Met Asp Val Met Phe Gly Gly Thr Glu Thr Val Ala Ser Ala Ile 325 330 335 Glu Trp Ala Met Ala Glu Met Met His Ser Pro Asp Asp Leu Arg Arg 340 345 Leu Gln Glu Leu Val Asp Val Val Gly Leu Asp Arg Asn Val Asp 365 360 Glu Ser Asp Leu Asp Lys Leu Pro Phe Leu Lys Cys Val Ile Lys Glu 375 Thr Leu Arg Leu His Pro Pro Ile Pro Leu Leu His Glu Thr Ala 390 395 Glu Asp Cys Val Val Gly Gly Tyr Ser Val Pro Arg Gly Ser Arg Val 405 410 Met Ile Asn Val Tyr Ala Ile Gly Arg Asp Arg Arg Ala Trp Lys Asp 420 425 430 Ala Asp Val Phe Arg Pro Ser Arg Phe Val Gln Gly Glu Gly Ala

PCT/NZ02/00239

440 435 Ala Gly Leu Asp Phe Lys Gly Gly Cys Phe Glu Phe Leu Pro Phe Gly 450 455 460 Ser Gly Arg Arg Ser Cys Pro Gly Met Ala Leu Gly Leu Tyr Ala Leu 470 475 Glu Leu Ala Val Ala Gln Leu Ala His Gly Phe Ser Trp Glu Leu Pro 485 490 Asp Gly Met Lys Pro Ser Glu Leu Asp Met Ser Asp Val Phe Gly Leu 500 505 Thr Ala Pro Arg Ala Thr Arg Leu Phe Ala Val Pro Thr Pro Arg Leu 515 520 525 Ala Cys Thr Gln Leu Leu Gly Ala Asp Asp Ala Gly Arg Gln Ala 535 . 540 530 <210> 184 <211> 713 <212> PRT <213> Festuca arundinacea <400> 184 Met Glu Cys Glu Asn Gly His Val Ala Ala Asn Gly Asp Gly Leu Cys 5 Val Ala Gln Pro Ala Arg Ala Asp Pro Leu Asn Trp Gly Lys Ala Ala 25 30 20 Glu Glu Leu Ser Gly Ser His Leu Asp Ala Val Lys Arg Met Val Glu 40 4.5 Glu Tyr Arg Arg Pro Val Val Thr Met Glu Gly Ala Ser Leu Thr Ile 55 Ala Met Val Ala Ala Val Ala Ala Gly Ala Asp Thr Arg Val Glu Leu 65 70 75 Asp Glu Ser Ala Arg Gly Arg Val Lys Glu Ser Ser Asp Trp Val Met 85 90 Asn Ser Met Ala Asn Gly Thr Asp Ser Tyr Gly Val Thr Thr Gly Phe 100 105 1.10 Gly Ala Thr Ser His Arg Arg Thr Lys Glu Gly Gly Ala Leu Gln Arg 120 125 Glu Leu Ile Arg Phe Leu Asn Ala Gly Ala Phe Gly Thr Gly Ser Asp 135 140 Gly His Val Leu Pro Ala Ala Thr Thr Arg Ala Ala Met Leu Val Arg 145 150 155 Val Asn Thr Leu Leu Gln Gly Tyr Ser Gly Ile Arg Phe Glu Ile Leu 165 170 175 Glu Thr Ile Ala Thr Leu Leu Asn Ala Asn Val Thr Pro Cys Leu Pro 180 185 190 Leu Arg Gly Thr Ile Thr Ala Ser Gly Asp Leu Val Pro Leu Ser Tyr 200 Ile Ala Gly Leu Val Thr Gly Arg Pro Asn Ser Val Ala Thr Ala Pro 220 210 215 Asp Gly Ser Lys Val Asn Ala Ala Glu Ala Phe Lys Ile Ala Gly Ile 230 235 240 Gln His Gly Phe Phe Glu Leu Gln Pro Lys Glu Gly Leu Ala Met Val 245 250 255 Asn Gly Thr Ala Val Gly Ser Gly Leu Ala Ser Ile Val Leu Phe Glu 265 270 Ala Asn Ile Leu Gly Ile Leu Ala Glu Val Leu Ser Ala Val Phe Cys 275 280 Glu Val Met Asn Gly Lys Pro Glu Tyr Thr Asp His Leu Thr His Lys 300 295 Leu Lys His His Pro Gly Gln Ile Glu Ala Ala Ala Ile Met Glu His 315 320 310 Ile Leu Glu Gly Ser Ser Tyr Met Met Leu Ala Lys Lys Leu Gly Glu 330 335 325 Leu Asp Pro Leu Met Lys Pro Lys Gln Asp Arg Tyr Ala Leu Arg Thr 345 350 340 Ser Pro Gln Trp Leu Gly Pro Gln Ile Glu Val Ile Arg Ala Ala Thr

PCT/NZ02/00239

Lys Ser Ile Glu Arg Glu Ile Asn Ser Val Asn Asp Asn Pro Leu Ile 370 375 380 Asp Val Ser Arg Gly Lys Ala Ile His Gly Gly Asn Phe Gln Gly Thr 390 395 Pro Ile Gly Val Ser Met Asp Asn Thr Arg Leu Ala Ile Ala Ala Ile 410 405 Gly Lys Leu Met Phe Ala Gln Phe Ser Glu Leu Val Asn Asp Phe Tyr 420 425 430 Asn Asn Gly Leu Pro Ser Asn Leu Ser Gly Gly Arg Asn Pro Ser Leu 435 440 445 Asp Tyr Gly Phe Lys Gly Ala Glu Ile Ala Met Ala Ser Tyr Cys Ser 455 460 Glu Leu Gln Phe Leu Gly Asn Pro Val Thr Asn His Val Gln Ser Ala 475 465 470 Glu Gln His Asn Gln Asp Val Asn Ser Leu Gly Leu Ile Ser Ser Arg 485 490 495 Lys Thr Ala Glu Ala Ile Asp Ile Leu Lys Leu Met Ser Ser Thr Phe 505 510 500 Met Val Ala Leu Cys Gln Ala Ile Asp Leu Arg His Ile Glu Glu Asn 520 525 Val Lys Asn Ala Val Lys Asn Cys Val Lys Thr Val Ala Arg Lys Thr 530 535 540 Leu Ser Thr Asn Asp Ser Gly His Leu His Asn Ala Arg Phe Cys Glu 545 550 555 Lys Asp Leu Leu Thr Ile Asp Arg Glu Ala Val Phe Ala Tyr Ala 565 570 575 Asp Asp Pro Cys Ser Ala Asn Tyr Pro Leu Met Gln Lys Met Arg Ala 585 590 580 Val Leu Val Glu His Ala Leu Ala Asn Gly Glu Ala Glu Gln Asp Val 595 600 605 Gln Thr Ser Val Phe Ala Lys Leu Ala Thr Phe Glu Gln Glu Leu Arg 620 610 615 Ala Val Leu Pro Lys Glu Val Glu Ser Ala Arg Cys Ser Val Glu Asn 625 630 635 Gly Thr Ala Ala Gln Gln Asn Arg Ile Ser Glu Cys Arg Ser Tyr Pro 650 655 645 Leu Tyr Arg Phe Val Arg Lys Glu Leu Gly Thr Glu Tyr Leu Thr Gly 665 670 Glu Lys Thr Arg Ser Pro Gly Glu Glu Val Asp Lys Val Phe Val Ala 675 680 685 Met Asn Gln Gly Lys His Ile Asp Ala Leu Leu Glu Cys Leu Lys Glu 690 695 Trp Asn Gly Glu Pro Leu Pro Ile Cys 705 710 <210> 185 <211> 324 <212> PRT <213> Lolium perenne <400> 185 Met Ala Pro Ala Thr Pro Lys Asp Ser Ser Ala Leu Pro Gly Leu Leu 5 10 1 Leu Leu Phe Ala Ala Ala Thr Ser Val Ala Val Ala Asn Ala Gln Leu 25 20 Ser Glu Asn Tyr Tyr Gly Ser Ser Cys Pro Thr Ala Leu Leu Thr Ile 40 45 Arg Thr Val Val Thr Thr Ala Val Leu Leu Asp His Arg Met Gly Ala 55 60 Ser Leu Leu Arg Leu His Phe His Asp Cys Phe Val Gln Gly Cys Asp 70 75 Ala Ser Val Leu Leu Asp Asp Thr Ala Gly Phe Thr Gly Glu Lys Gly 90 85 Ala Gly Pro Asn Ala Gly Ser Leu Arg Gly Leu Glu Val Ile Asp Lys 100 105 Ile Lys Met Leu Leu Glu Phe Met Cys Pro Arg Thr Val Ser Cys Ala

120 Asp Ile Leu Ala Val Ala Ala Arg Asp Ser Val Val Arg Leu Gly Gly 130 135 140 Pro Ser Trp Ala Val Gln Leu Gly Arg Arg Asp Ala Thr Thr Ala Ser 145 150 155 160 Ala Ser Leu Ala Ser Ser Asp Leu Pro Gly Pro Asn Ser Asn Leu Asn 165 170 175 Asp Leu Leu Thr Ala Phe Ser Lys Lys Gly Leu Ser Thr Thr Asp Met 180 185 190 Val Ala Leu Ser Gly Ala His Thr Ile Gly Arg Ala Gln Cys Gln Asn 195 200 Tyr Arg Asn Arg Ile Tyr Thr Asp Thr Asp Ile Asp Gly Ala Phe Ala 210 215 220 Ala Ser Leu Arg Gly Gly Cys Pro Gln Ala Gly Gly Asp Gly Asn Leu 230 235 Ala Pro Leu Asp Ala Ser Ser Pro Asn Thr Phe Asp Asn Gly Tyr Phe 250 Ser Gly Leu Leu Ser Arg Gln Gly Leu Leu His Ser Asp Gln Ala Leu 260 265 270 Tyr Asp Gly Gly Ser Thr Asp Asp Leu Val Arg Thr Tyr Ala Ser Asn 275 280 285 Asn Asp Gln Phe Gly Ser Asp Phe Ala Ala Ala Met Val Lys Leu Ser 290 295 300 Asn Ile Gly Leu Leu Thr Gly Ser Ser Gly Glu Ile Arg Val Asn Cys 315 Arg Ala Val Asn <210> 186 <211> 398 <212> PRT <213> Lolium perenne <400> 186 Met Ala Ala Thr Met Thr Val Glu Glu Val Arg Lys Ala Gln Arg Ala 5 10 Glu Gly Pro Ala Thr Val Leu Ala Ile Gly Thr Ala Thr Pro Ala Asn 20 25 Cys Val Tyr Gln Ala Asp Tyr Pro Asp Tyr Tyr Phe Lys Ile Thr Lys 40 Ser Asp His Leu Ala Asp Leu Lys Glu Lys Phe Lys Arg Met Cys Asp 50 60Lys Ser Gln Ile Arg Lys Arg Tyr Met His Leu Thr Glu Glu Ile Leu 70 75 Glu Glu Asn Pro Asn Met Cys Ala Tyr Met Ala Pro Ser Leu Asp Ala 85 90 Arg Gln Asp Ile Val Val Val Glu Val Pro Lys Leu Gly Lys Ala Ala 100 105 Ala Gln Lys Ala Ile Lys Glu Trp Gly Gln Pro Arg Ser Lys Ile Thr 115 120 125 His Leu Val Phe Cys Thr Thr Ser Gly Val Asp Met Pro Gly Ala Asp 130 135 140 Tyr Gln Leu Thr Lys Met Leu Gly Leu Arg Pro Ser Val Lys Arg Leu 145 150 155 Met Met Tyr Gln Gln Gly Cys Phe Ala Gly Gly Thr Val Leu Arg Leu 175 170 Ala Lys Asp Leu Ala Glu Asn Asn Arg Gly Ala Arg Val Leu Val Val 180 185 Cys Ser Glu Ile Thr Ala Val Thr Phe Arg Gly Pro His Glu Ser His 195 200 205 Leu Asp Ser Leu Val Gly Gln Ala Leu Phe Gly Asp Gly Ala Ala Ala 215 220 Val Ile Ile Gly Ala Asp Pro Asp Val Ser Val Glu Arg Pro Leu Phe 225 230 235 240 Gln Leu Val Ser Ala Ser Gln Thr Ile Leu Pro Asp Ser Glu Gly Ala

Ile Asp Gly His Leu Arg Glu Val Gly Leu Thr Phe His Leu Leu Lys 265 260 Asp Val Pro Gly Leu Ile Ser Lys Asn Ile Glu Arg Ala Leu Glu Glu 285 275 280 Ala Phe Lys Pro Leu Gly Ile Asp Asp Trp Asn Ser Val Phe Trp Val 295 300 Ala His Pro Gly Gly Pro Ala Ile Leu Asp Met Val Glu Ala Lys Val 310 315 320 Asn Leu Asn Lys Glu Arg Met Arg Ala Thr Arg His Val Leu Ser Glu 325 330 335 Tyr Gly Asn Met Ser Ser Ala Cys Val Leu Phe Ile Met Asp Glu Met 345 350 340 Arg Lys Arg Ser Ala Glu Asp Gly His Thr Thr Thr Gly Glu Gly Met 360 Asp Trp Gly Val Leu Phe Gly Phe Gly Pro Gly Leu Thr Val Glu Thr 370 375 Val Val Leu His Ser Met Pro Ile Ala Ala Asp Ala Thr Ala 390 <210> 187 <211> 370 <212> PRT <213> Festuca arundinacea <400> 187 Met Lys Gln Glu Val Lys Ser Glu Met Asn Gly Glu Thr Met Ser Gly Asn Lys Gly Pro Val Val Val Thr Gly Ala Ser Gly Phe Val Gly Ser 20 25 Trp Leu Val Met Lys Leu Leu Gln Ala Gly Tyr Thr Val Arg Ala Thr 40 4.5 Val Arg Asp Pro Gly Asn Val Glu Lys Thr Lys Pro Leu Leu Glu Leu 55 60 Pro Gly Ala Lys Glu Arg Leu Ser Ile Trp Arg Ala Asp Leu Ser Glu 70 75 Glu Gly Ser Phe Asp Glu Ala Ile Ala Gly Cys Thr Gly Val Phe His Val Ala Thr Pro Met Asp Phe Glu Ser Lys Asp Pro Glu Asn Glu Val 100 105 110 Ile Lys Pro Thr Val Glu Gly Met Leu Ser Ile Met Arg Ala Cys Lys 115 120 125 Glu Ala Gly Thr Val Lys Arg Val Val Phe Thr Ser Ser Ala Gly Thr 135 140 Val Asn Ile Glu Glu Arg Pro Arg Pro Ala Tyr Asp Gln Asp Asn Trp 150 155 Ser Asp Ile Asp Phe Cys Arg Arg Val Lys Met Thr Gly Gln Met Tyr 165 170 Phe Val Ser Lys Ser Leu Ala Glu Lys Ala Ala Met Asp Tyr Ala Lys 180 185 190 Glu Asn Gly Val Asp Phe Ile Ser Ile Ile Pro Thr Leu Val Val Gly 195 200 205 Pro Phe Leu Ser Ala Gly Met Pro Pro Ser Leu Val Thr Ala Leu Ala 215 220 Leu Ile Thr Gly Asn Glu Ala His Tyr Ser Ile Leu Lys Gln Val Gln 230 235 Leu Val His Leu Asp Asp Leu Cys Asp Ser Met Thr Tyr Leu Phe Glu 245 250 His Pro Asp Ala Asn Gly Arg Tyr Ile Cys Ser Ser His Asp Thr Thr 260 270 265 Ile His Gly Ile Ala Arg Met Leu Lys Glu Arg Phe Pro Glu Tyr Asp 275 280 285 Ile Pro Gln Lys Phe Pro Gly Val Asp Asp Asp Leu Gln Pro Ile His 295 300 Phe Phe Lys Lys Leu Leu Asp His Gly Phe Arg Phe Arg Tyr Thr 310 315 Ala Glu Asp Met Phe Asp Ala Ala Val Trp Thr Cys Arg Glu Lys Gly

```
325
                           330
Leu Ile Pro Leu Gly Ala Glu Gly Ala Gly Gly Pro Ala Ser Ala Ala
  340 345
Gly Lys Leu Gly Ala Val Leu Val Gly Glu Gly Gln Ala Ile Gly Ala
 355 360
Glu Thr
 370
<210> 188
<211> 329
<212> PRT
<213> Lolium perenne
<400> 188
Met Ala Thr Glu Ala Lys Gly Glu Thr Val Leu Val Thr Gly Ala Ser
          5
                            10
1
Gly Phe Ile Gly Ser Trp Leu Val Arg Leu Leu Ala Arg Gly Tyr
                      25
        2.0
Ser Val His Ala Ala Val Leu Asn Pro Asp Asp Lys Ala Glu Thr Asp
                   40
                                   45
His Leu Leu Ala Leu Ala Ala Ala Gly Asp Glu Gly Arg Ile Arg
                  55
                                  60
Phe Phe Arg Cys Asp Leu Leu Asp Gly Ala Ala Met Leu Ala Ala Val
65 70
Arg Gly Cys Ser Gly Val Phe His Leu Ala Ser Pro Cys Thr Val Asp
          85
                90
Leu Val Leu Asp Pro Gln Lys Glu Leu Val Val Pro Ala Val Glu Gly
         100 105 110
Thr Leu Asn Val Leu Arg Ala Ala Lys Glu Ala Gly Gly Val Arg Arg
 115 120 125
Val Val Val Thr Ser Ser Val Ser Ala Leu Val Pro Cys Pro Gly Trp
               135
                                 140
Pro Ala Gly Glu Val Leu Asp Glu Arg Cys Trp Thr Asp Ile Asp Tyr
                             155
145 150
Cys Asp Lys Asn Gly Val Trp Tyr Pro Ala Ser Lys Ala Leu Ala Glu
                           170
            165
                               175
Lys Ala Ala Trp Lys Phe Ala Glu Glu Asn Gly Leu Asp Val Val Thr
         180
                        185
                                       190
Val Asn Pro Gly Thr Val Leu Gly Glu Met Ile Pro Pro Arg Leu Asn
 195 200 205
Ala Ser Met Ala Met Phe Leu Arg Leu Leu Glu Gly Cys Lys Glu Glu
 210 215
                                  220
Tyr Ala Asp Phe Phe Ile Gly Pro Val His Val Glu Asp Val Ala Leu
225 230 235
Ala His Ile Leu Leu Tyr Glu Asn Pro Ser Ala Ser Gly Arg His Leu
                           250
                                           255
           245
Cys Val Glu Pro Ile Cys His Trp Ser Val Phe Ala Ala Lys Val Ala
                         265
                               270
Glu Leu Tyr Pro Asp Tyr Lys Val Pro Lys Phe Pro Glu Asp Thr Gln
                    280 285
Pro Gly Leu Val Arg Ala Glu Ala Val Pro Lys Lys Leu Met Ala Leu
 290 295
                                 300
Gly Leu Gln Phe Thr Pro Leu Glu Lys Ile Ile Arg Asp Ala Val Glu
305 310
                               315
Ser Leu Lys Ser Arg Gly Cys Ile Ala
            325
<210> 189
<211> 330
<212> PRT
<213> Lolium perenne
<400> 189
Met Val Ser Ser Thr Lys Gly Lys Val Cys Val Thr Gly Ala Ser Gly
1 5
                      10
Phe Val Ala Ser Trp Leu Ile Lys Lys Leu Leu Glu Ser Gly Tyr His
```

			20					25					30		
		35	Thr				40					45			
	50		Leu			55					60				
65			Glu		70					75					80
_			His	85					90					95	
			Ala 100					105					110		
		115	Cys				120					125			
	130		Ser			135					140				
145			Asp		150					155					160
			Trp	165					170					175	
			Ala 180					185					190		
		195	Ile		•		200					205			
	210		Leu			215					220				
225			Met		230					235					240
			Tyr	245					250					255	
			Leu 260					265					270		
		275	Phe				280					285			
	290	_	Gln			295					300				
305			Val		310					Cys 315	Val	Glu	Ser	Leu	Lys 320
Asp	Gln	Gly	His	Leu 325	Leu	Glu	Cys	Pro	Leu 330						
<21	0> 1	90													
	1> 3: 2> P:														
<21	3> L	oliu	m pe	renn	e										
	0> 1 Ala		Ala	Thr	Pro	Lvs	Asp	Ser	Ser	Ser	Ser	Ala	Leu	Pro	Gly
1			Leu	5					10					15	
			20 Glu					25					30		
		35	Thr				40					45			
	50		Leu			55					60				
65			Ser		70					75					80
			. Gly	85					90					95	
			100 Lys					105					110		
		115					120					125			
	130		Ile			135					140				
145		Pro	Ser	тгЪ	150		GTU	ъеи	. Эту	155		Ash	лта	1114	160

```
Ala Ser Ala Ser Leu Ala Ser Ser Asp Leu Pro Gly Pro Asn Ser Asn
                                 170
               165
Leu Asn Asp Leu Leu Thr Ala Phe Ser Lys Lys Gly Leu Ser Thr Thr
                            185
                                               190
           180
Asp Met Val Ala Leu Ser Gly Ala His Thr Ile Gly Arg Ala Gln Cys
    195
                         200
                                             205
Gln Asn Tyr Arg Asn Arg Ile Tyr Thr Asp Thr Asp Ile Asp Gly Ala
                      215
                              220
Phe Ala Ala Ser Leu Arg Gly Gly Cys Pro Gln Ala Gly Gly Asp Gly
           230
                          235
Asn Leu Ala Pro Leu Asp Ala Ser Ser Pro Asn Thr Phe Asp Asn Gly
               245
                                 250
Tyr Phe Ser Gly Leu Leu Ser Arg Gln Gly Leu Leu His Ser Asp Gln
           260
                           265
Ala Leu Tyr Asp Gly Gly Ser Thr Asp Asp Leu Val Arg Thr Tyr Ala
                       280
                                            285
      275
Ser Asn Asn Asp Gln Phe Gly Ser Asp Phe Ala Ala Ala Met Val Lys
                                 300
                    295
Leu Ser Asn Ile Gly Leu Leu Thr Gly Ser Ser Gly Glu Ile Arg Val
                  310
                                    315
Asn Cys Arg Ala Val Asn
<210> 191
<211> 26
<212> DNA
<213> Artificial Sequence
<220>
<223> Made in the lab
<400> 191
                                                                  26
catatggata agctcaatgg ttctgc
<210> 192
<211> 21
<212> DNA
<213> Artificial Sequence
<220>
<223> Made in the lab
<400> 192
                                                                  21
cggtagagat ccagtctaga g
<210> 193
<211> 28
<212> DNA
<213> Artificial Sequence
<220>
<223> Made in the lab
<400> 193
                                                                  28
tacatatgct gcacgagaag ttctacag
<210> 194
<211> 21
<212> DNA
<213> Artificial Sequence
<220>
<223> Made in the lab
```

<400> 194 ccacggctaa ctaatggttc a	21
<210> 195 <211> 29 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 195 tacatatgaa aggttctggg ctgtccgtc	29
<210> 196 <211> 22 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 196 ctagttcacc ttggagcagt tg	22
<210> 197 <211> 18 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 197 gcagacggcg gtctactt	18
<210> 198 <211> 23 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 198 aaatgcaagt gacccaacgt tac	23
<210> 199 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 199 tcatgacgat tccaagaacg	20
<210> 200 <211> 19 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	

<400> 200 gttgaccgtg actcgtcgt	19
<210> 201 <211> 27 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 201 actgaattct cggtcccagc ctccatt	27
<210> 202 <211> 29 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 202 gtagcggccg cgcgaaaact cgtcggaga	29
<210> 203 <211> 27 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 203 gctgaattcc tccgatggct ctctgac	27
<210> 204 <211> 28 <212> DNA <213> Artificial Sequence	-
<220> <223> Made in the lab	
<400> 204 atgcggccgc aagtccaatc ggccacac	28
<210> 205 <211> 25 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 205 tatgaattcg gcgccgacgc cggca	25
<210> 206 <211> 27 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	

<400> 206 atgcggccgc gcaacatgct agcacaa	27
<210> 207 <211> 19 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 207 aaacagaagt agcggcggc	19
<210> 208 <211> 18 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 208 ggtcgtagaa ggacttgg	18
<210> 209 <211> 18 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 209 cgccttcatc ttcaagac	18
<210> 210 <211> 17 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 210 agccctggcg taaatgg	17
<210> 211 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 211 gacgcaagga gagatccaga	20
<210> 212 <211> 20 <212> DNA <213> Artificial Sequence	
<220>	

<400> 212 agacgaggtg ggtgatcttg	20
<210> 213 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 213 tccatcctct tcacccactc	20
<210> 214 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 214 ggcagcggtt tctttattca	20
<210> 215 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 215 ggccatgttt cttcgcttac	20
<210> 216 <211> 20 <212> DNA <213> Artificial Sequence	
<220>	
<400> 216 ctacgacgga agggtgacat	20
<210> 217 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	
<400> 217 gtggacatgg accagaaggt	20
<210> 218 <211> 20 <212> DNA <213> Artificial Sequence	
<220> <223> Made in the lab	

<400> 218 cggtacatct cggtgaaggt